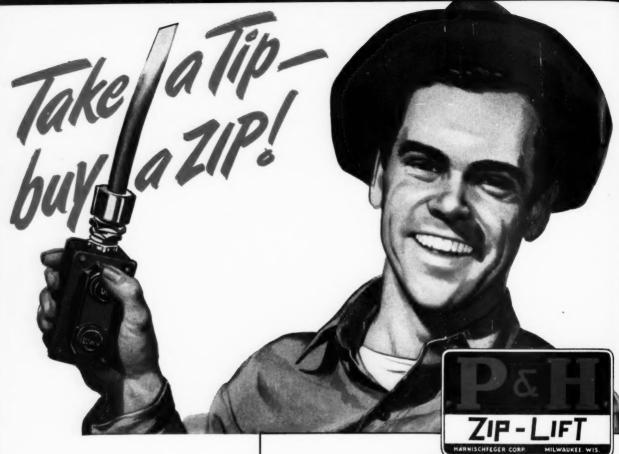


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CIRCULATION THIS ISSUE - 27,343



W HY settle for anything less? The Zip-Lift is the real wire rope electric hoist — with full magnetic push-button control and the top-notch qualities you'd expect only in the most expensive hoisting equipment.

If you have heavy loads (anything up to 2,000 lbs.) you can't lose with a Zip-Lift. It starts earning the moment you hang it up on hook, jib or trolley — pays for itself several times a year. Why postpone the savings it brings you? Add a new Zip to your production — now!

Ask for your copy of Bulletin H20-3. It covers everything you want to know about the P&H Zip-Lift—applications, pictures, specifications, etc.





SAFER—Control current is reduced to 110 volts at the push-button. Crane type limit switch and double brakes provide maximum safety.

LIFETIME CONSTRUCTION — Shaved gears — grease-sealed bearings — precision construction — moisture-proof, dust-proof, acid-proof,

SMOOTHER OPERATION — Motor specifically built for hoist service — high starting torque, frequent reversal, etc. Controls loads within a fraction of an inch.

ALERT SERVICE — Out-of-stock delivery from qualified dealers everywhere — backed by 18 branch offices and 8 conveniently located ware-houses.

The Zip-Lift is America's fastest selling wire rope hoist.



## P&H

#### ELECTRIC HOISTS

4643 West National Avenue Milwaukee 14, Wis.

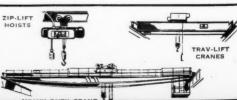
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LOSTS - WELDING ELEGTADOS - MC WELDERS

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ONLY AUTOMATIC SKYLIFT ELECTRIC TRUCKS GIVE YOU "BURN-OUT PROOF" SILICONE **INSULATED MOTORS** 

Motor Failure Means Going Back TO THIS



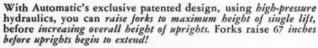


onstant starting, stopping, reversing and overloading give an electric motor an awful beating — often cause overheating, which means motor failure, trucks out of service.

Automatic foresaw the demands which would be put on Skylift Electric Trucks, so gave you the protection of SILICONE MOTOR INSULATION. This is an exclusive silicone varnish and silicone lubricant that protects Skylift motors, even if overloaded, and even after exposure to temperatures of 300 to 400 degrees Fahrenheit.

This means no armature or field coil failure, no trucks laid up for motor repair, no interruption of Skylift's smooth, efficient money-saving material-handling operation. NO OTHER material-handling trucks offer this EXCLUSIVE feature!

#### Only Skylift Gives You **High Pressure Hydraulic Lift!**



As you see by the pictures at the left, you get easy entry into box cars and other low clearance portals. You tier your product to maximum height without uprights jabbing into ceilings. The same Skylift also tiers up to 130 inches high. Only Automatic Skylifts offer you this double-duty money-saving feature, because ONLY Skylift Electric Trucks are equipped with HIGH PRES-SURE Hydraulic Lift. Mail coupon.



#### **Automatic** is First with Most Great Features

Caster type steering axle, center pivoted and shock-proof. Compensates for uneven floor conditions. Provides easier steering, prevents transmission of road shock to steering wheel.

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Lift, tilt and drive simultan-eously or independently with easy fingertip and foot control regardless of load conditions. The only hydraulic industrial truck that does not sacrifice lift or tilt performance to accomplish this feature, because only Skylift has High Pressure Hydraulic Lift and Tilt.

Full automotive type controls. Brake pedal and foot accelerator same as a car. One lever controlls lift and tilt, the other forward and reverse. NEW-matic controller gives smooth, timed automatic acceleration through all speads.

Air-cooled disk brake. Mounted on end of motor where brake torque is least. This greatly prolongs life, gives greater braking surface, insures positive and smooth stopping.

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Cut 20% to 30% from present production costs with Towmotor Mass Handling. Rushing raw materials to production lines—speeding finished products to shipping—stacking full loads into overhead storage space—Towmotor is the busiest piece of equipment you'll ever own! Gasoline-powered Towmotor Fork Lift Trucks lift, transport and stack full loads any time, anywhere—operate at maximum capacity 24 hours a day, every day. Towmotor handling keeps pace with production. Take a tip from the men who make handling pay a profit: More

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professional handlers use Towmotor than any other fork

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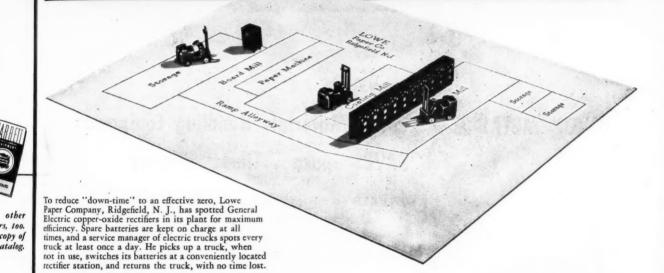
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## CENTRAL RECTIFIER STATION speeds heavy handling jobs

FOR LOWE PAPER COMPANY

 Secondary station strategically spotted to handle trucks on separate routes



LOWE PAPER COMPANY, manufacturer of Ridgelo Clay Coated Boxboard packaging, had a big handling job—involving bulky loads of supplies and heavy stocks of finished paper. For this big job, the company's solution was a. fleet of platform and lift-type electric trucks, efficient spotting of General Electric copper-oxide rectifiers, and a fast-moving system of battery

Twenty of these trucks, working throughout the center of the plant, are handled by a bank of 15 General Electric copper-oxide rectifiers, centrally located for fast service. Two trucks, operating almost continuously in the storage building at the end of the plant, are kept close to their jobs by one General Electric rectifier, strategically spotted for efficiency.

Effective rectifier spotting goes a long way in the job of getting maximum work, maximum savings from electric truck systems. And the choice of General Electric copper-oxide rectifiers goes a long way toward squeezing operating costs down to the last cent.

We'd like to give you the dollars-and-sense picture of General Electric rectifiers. We'd like to tell you how leaders in all phases of industry have learned to depend on them for years of service with hardly any maintenance. Why not ask us to have a representative call on you? Or, if you prefer, just write for the free booklet, Aids to Economical, Faster Materials Handling. Section A4-736, General Electric Co., Bridgeport 2. Connecticut.

GENERAL (%)



**ELECTRIC** 





PICTURED on this page is a typical example of how Union Metal steel pallets increase production line efficiency...reduce handling costs...ease employees' work.

The double deck pallets shown are being used to store unit loads of heavy copper ingots. The "sandwich style" stacking makes the most effective use of every cubic foot of storage area. "Dead" overhead space is put to work. Floor space is kept clear for production needs. Materials can be moved quickly, safely, in unit loads.

You gain these benefits with all of Union Metal's rugged, long-lasting materials handling units . . . steel Skid Platforms, Boxes, and Pallets . . . because they're engineered for their jobs. For complete information, write for free Bulletin MH-806. The Union Metal Manufacturing Co., Canton 5, Ohio.

#### UNION METAL

Materials Handling Equipment

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SAFE, NON-KINKING, FLEXIBLE, Roebling "Flatweave" Wire Rope Slings save time because they're easy to handle. You can use "Flatweave" Slings without fittings—apply the entire weight of the sling for lifting capacity. Readily passed through and under loads, this unique sling brings new economy to innumerable lifting jobs.

Roebling developed an exclusive method of construction for "Flatweave" Slings...six individual wire ropes woven to form a wide, flat surface. This provides a broad bearing area against which pressure is evenly distributed...the life of the sling is correspondingly prolonged.

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SEND FOR BULLETIN C-1.

A 56-page book showing successful applications of American MonoRail Systems,



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Allegheny Ludlum Steel uses the Prime Mover to haul foundry sand.



American Brake Shoe Company uses it to haul iron foundry scrap.



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Adaptable to any bulk materials . . . sand, gravel, dirt, concrete, grain, steel

scrap. Equipped with platform, it hauls such things as electric motors, reels of wire, rolls of fabric or paper, concrete blocks, tile, brick.

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And hundreds of other companies have found innumerable uses for this highly versatile "grandson of the wheelbarrow"...among them:

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- Bucket holds 10 cu. ft....18 with sideboards.
- Gear driven . . . no belts or chains.
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City, Zone & State .....

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of 14 in operation.

This nationally known company is one of many customers who order Moto-Trucs repeatedly in face of wide competition.

THE OUTSTANDING ADVANTAGES accounting for repeat orders are—shorter overall length ... shorter turning radius, permitting operation in narrow aisles . . . low line of gravity prevents tipping . . . interchangeable motor unit for keeping trucks in constant operation . . low cost of maintenance . . . natural grip control handle . . . all welded construction . . . brake applied to drive wheel . . . and many other exclusive features.





WRITE FOR BULLETIN 47-A showing the most complete line of motorized hand trucks such as Pallet, Platform, THE MOTO-TRUCCS., 1953 E.59th St., Cleveland 3, Ohio. Originators of Motorized Hand Lift Trucks

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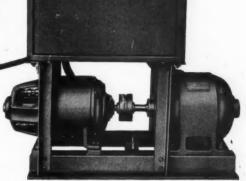
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For lead-acid or nickel-alkaline batteries-for any number at a time-General Electric can supply the proper kind of motor-driven battery-charging equipment. With the help of your truck manufacturer, you can quickly select what you need from the many sizes available-knowing all G-E equipment is fully automatic, tailored to fit the battery, and protectively enclosed. All sizes comply with industry standards. More information in G-E bulletin, GEA-3923B. Simply ask your nearest G-E sales office or write Apparatus Dept., General Electric Company, Schenectady 5, N.Y.



New single-circuit automatic battery charger



to operate. Fully automatic from start to finish, compact, easy to install, economical to operate-built for long life and dependable service -these motor-driven battery chargers comply with the Standard Specifications of the Electrical Industrial Truck Association.

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Greater efficiency in material handling means greater earning power in any plant. Start paring unnecessary moves for production hands or warehouse men and you not only reduce handling cost per unit, but make way for volume never before possible.

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#### NO OTHER CASTER COMPARES IN STRENGTH

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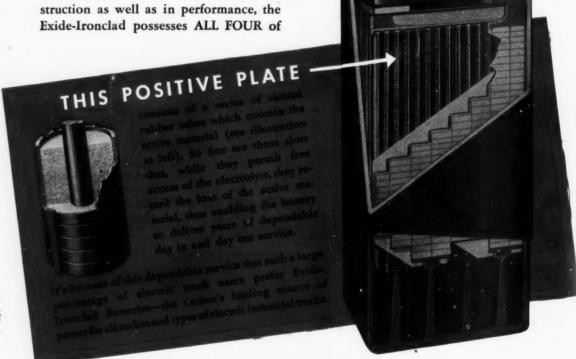
## IRONCLAD BATTERIES

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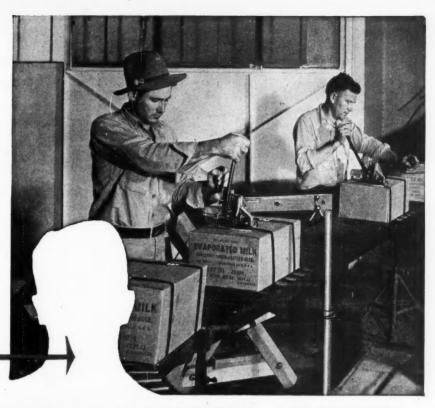
the essential characteristics demanded of a battery for electric industrial truck service—(1) high power ability, (2) high efficiency, (3) great ruggedness, and (4) long life. These characteristics are due to the special construction of the Exide-Ironclad Battery, especially its rugged, tubular positive plate.



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113 Design 1



Design 106 Wood-Steel

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Style 310 Fork Type



Roll-Over



Style 311 Platform Type

CRANE TIERING BOX PLATFORMS



Style 202A

#### **CASTER BOX**



LIFT TRUCK PLATFORMS



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STEEL BOX PLATFORM



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Assembled



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- Low Power Costs



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- Reduces Charging Costs by Saving Man-Hours
- Easy to Operate



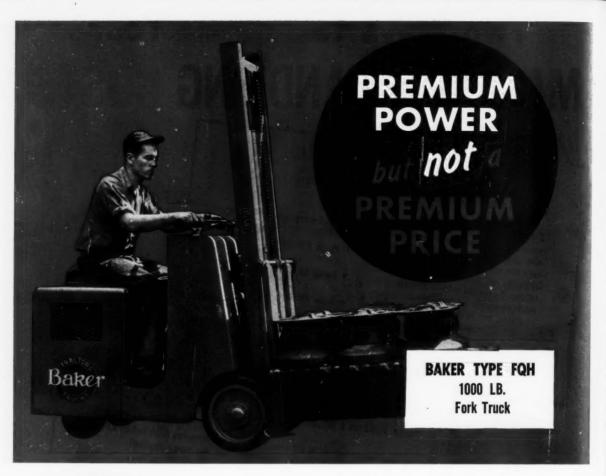


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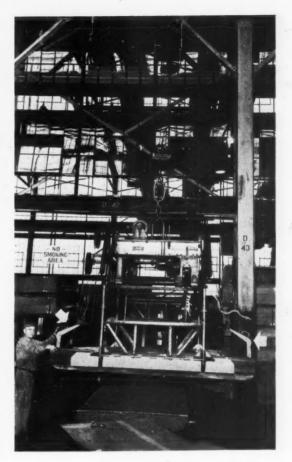
FI



TRAVELING BRIDGE CRANE uses both hooks to lift large odd-shaped dies.

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C-HOOKS at both ends of sheet grab (arrow) prevent bellying of sheet stock in transit.

## **HANDLING DIES**

(3,000 to 80,000 pounds)

Thousands of automotive dies are moved here. The overhead handling equipment includes (besides bridge cranes) a system of transfer cranes consisting of 23 hoisting units with capacities ranging from 6000 to 20,000 pounds. Safe procedures are maintained, as well as on-schedule deliveries of repaired dies to the production departments.

THE fabrication of a "Body by Fisher" starts with dies—many of them. While the large body dies weigh 40 tons or more, they must be handled like raw eggs. Machined surfaces must be protected against the slightest nicks or other damage. More than 300 forming presses—from those in the 4-ton to others in the 1000-ton class—depend on the constant availability of dies, requiring the Tool and Die Room to make repairs and engineering changes on schedule.

Thousands of dies are in constant use at the Cleveland Plant of the Fisher Body Division, General Motors Corp., and this description tells you about the safe procedures that have been developed in handling these expensive units between numerous work stations.

#### Bridge Crane, Transfer Car, Chain Slings

The storage area for the large dies is in the north end of the plant, directly adjoining the body press department where the roof panels and the floor pans are fabricated. This north end is a two-bay building. The west bay, adjacent to the railroad spur, is devoted to steel storage, the east bay serving as the die room. Each of the 75'x360' bays is covered by a traveling bridge crane.

The large dies arrive on flat cars and are spotted under the span of the crane serving steel storage. The dies are then placed on a flanged-wheel transfer car which is powered with an electric motor. This car brings the units under the span of the 50-ton crane in the adjoining bay. Since the maximum move from bay to bay is only about 15 feet, the electric motor receives its power through a cable that is plugged into an outlet on a nearby post.

The 50-ton crane in the die repair room also has a 10-ton auxiliary hook. The dies are placed, usually single deck, on 4"x4" dunnage in the area. The dies in the medium category may be double decked if they have flat surfaces that permit safe stacking. When the crane lifts one of the huge dies—with the riser plate, it may be more than five feet high and about nine feet long—the auxiliary hook is used simultaneously with the large one for purposes of straightening the load.

All dies have chain slots to prevent the slings from slipping off while the lifts are being made. Chain slings are used in various sizes, depending on the weight of the lifts. Chain sizes range from \%2" to 1\\\4". Good housekeeping and safe practice are observed by the use of a chain rack installed near the center of the die room.

The rack has eight slots, four on each side. The top ring is set in a slot, the chain hanging down into a five-sided enclosure at the bottom. Thus no lengths of chain are ever underfoot in aisleways or operating areas. The crane operator can, without aid, deposit any chain

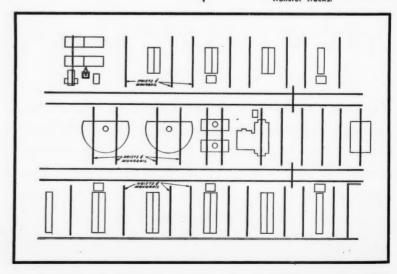
in the rack as well as pick any up.

Some sheet stock is also stored in the die repair room. This material is handled with the type of sheet grab shown in one of the photos. The heavier of the grabs used has a capacity of 20,000 pounds. A feature of this equipment will in-

PART OF 23 HOISTS and crane system. Transfer crane is shown on longitudinal



Layout sketch of transverse monorail cranes
over three bays, with connecting longitudinal
transfer tracks.



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terest many users of sheet steel who encounter the problems of loads bellying during lifting and transfer operations. This problem is avoided by means of the two C-shaped hooks, one at each end, which are part of the original grab equipment. These hooks, suspended from a cable, are set around the ends of the bundle by use of a separate chain wheel (another chain wheel adjusts the jaws). Thus a suspended bundle of sheet steel has a four-way support, preventing the possibility of bulging which may bend the stock out of shape.

#### To the Forming Presses

Dies are transferred to the adjoining press department by the 50-ton bridge crane in the manner already indicated. Aisleways between presses are at a minimum for reasons of maximum productive capacity. The die to be set is spotted across from the press on an I-beam. I-beam sizes vary, of course, in accordance with the height of the press beds. A cable is threaded through two eye bolts on the die and is then passed through a sheave or pulley and hooked on the crane block. As the crane makes the lift,

the die is inched horizontally into the press. The sheave or pulley, incidentally, is attached to a ring which is anchored to a depth of six feet in the ground a few inches below floor level. One ring is thus anchored across from each press and a manhole cover over the depression maintains an even floor level.

With the huge 180-inch presses towering on all sides, the crane operator frequently has no direct view of the floor area where a die is being set. In such blind areas, he has to rely solely on the signals given him by the hook-up man as the huge die is inched into position for bolting to the press. The correct training of hook-up men therefore is a matter of prime importance to personnel and equipment. A comprehensive safety program is in effect, and rules are rigidly enforced. Part of the instructions for crane operators and hook-up men are reproduced elsewhere in this article from the plant's safety practices booklet.

The technique described for setting dies is of course reversed for removing them from the presses. Dies in use two and three shifts per day must necessarily be changed periodically. Normal repairs are done on the press room floor, while



SLOTTED CHAIN RACK gives crane operator easy and safe access to any chain sling as it is needed.

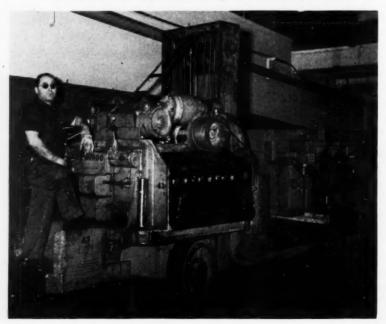
major repairs or engineering changes are performed in the Tool and Die Department, which is some 400 feet distant.

#### **Precision Spotting**

The heavier of the hauling jobs to the tool room are performed by a die truck of 50,000-pound capacity, shown in one of the photos. This truck is also used for transporting dies, or die sections, to an adjoining press area not under the span of the die room crane. The truck's bed is 60" wide by 96" long. A winch pulls the dies onto the bed (unless the loading in particular cases is done by crane). During travel, the hooks at the end of the winch cables are attached to the front of the load, and the cables are tightened, to prevent the die from sliding. A 10,000-pound capacity die truck, of similar design, is used around the plant for transporting the smaller dies between the numerous work areas.

The Tool and Die Department consists of two adjacent buildings, one at right angles to the other. In the north-south bay (75'x360') the large and medium size dies are repaired and built. This long bay is covered by two 30-ton traveling bridge cranes, each with a 10-ton

This 50,000 lb. die truck transports heavy dies between departments.



SAVE 50% FLOOR SPACE EQUIPMENT COST

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Wooden-side Bin Sections on Pallet stacked on All-steel Bin Sections on Transport.



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## MATERIAL HANDLING Mews



Positioning heavy steel tubing for lathe operator by gas-powered Trucloader



Five boxes of bananas are easily handled by Elec-Trucloader with special forks



Hustling boxes of tools and parts is one of many uses for this gas-powered Trucloader

Here's an ideal lowcost answer to a thousand-and-one high-cost jobs...the CLARK

. . . either gas or electric battery-powered

TRUCLOADER

It's the countless little handling jobs that are Industry's subtlest thieves because they are so easy "not to notice"—that multitude of loads from 200 to 1000 pounds, familiar to every busy plant and dock and warehouse. Subtle thieves because they look innocent—yet their petty thieveries total a staggering sum!

Put an end, finally, to their costly pocket-picking — by using the Clark Trucloaders.

Use these Trucloaders in the plant: for setting-up of machining jobs, handling jigs and fixtures, loading furnaces, fetching tools, hustling dies, castings and other "heavies" to storage or scrap. Use them in the warehouse: to tier palletized units, carry empty drums and crates, handle loads on low-capacity elevators.

Use the Trucloaders for loading and unloading carriers —highway or rail. Use them as tireless, ever willing handymen for the 1000-and-one lift-and-carry chores common to all busy establishments. You'll find many uses —because every use means a substantial saving.

A wise first step is to talk about your needs with a Clark field representative. He can tell you how businesses like yours make big savings with the Trucloaders—both gas-powered and electric battery-powered. It's always good business to CONSULT CLARK.

auxiliary hook. Thus there is amplelifting capacity for handling the largest die sections, while the smaller hooks can be used economically for the lighter lifts.

An interesting fact is that these cranes have their fixed cabs attached to the center of the bridge, as shown in one of the photos, giving the crane operator maximum visibility to either side of the bay. With the cabs extending directly over the center aisle, the areas on either side are left free for the high machinery located along the walls.

A high degree of skill—as well as cooperation between hook-up man and crane operator—is called for in spotting the heavy lifts of irregular contour on the stands or plates of the machines, or on the parallels of the radial drills. On the large planers on which the dies are squared up, the cranes do the positioning until the large pieces are blocked. This applies to dies being repaired as well as new ones in the process of manufacture. After completion of the exacting machining operations, the cranes pick up the

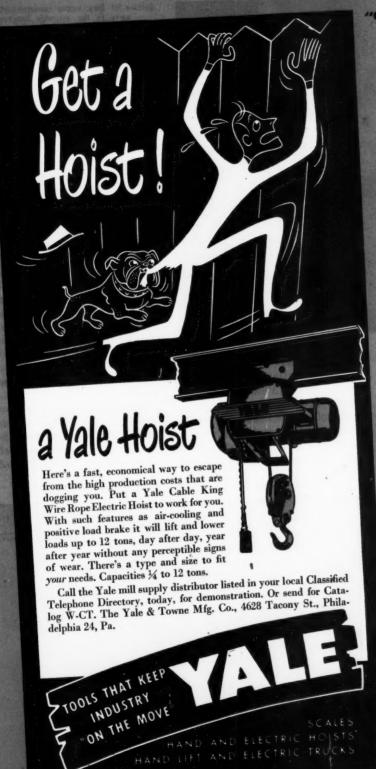


TWO THIRTY-TON CRANES cover die room for medium units. Note center-mounted crane cabs.

die sections, carry them through the bay and load them at the south and on the die truck for delivery to the job.

#### System of Transfer Cranes

A system of transfer cranes is used in the adjoining building of the Tool and Die Department (Turn to page 30)



"ON THE MOVE" WITH YALL



HEAVY, MULTI-UNIT LOADS get handled in a lifty and with no need for muscle straining with this Yale Worksaver Polite Truck on the job. Capacity 4,000 libs. 6 other types of Worksaver Trucks from 1,000 to 6,000 libs. capacilles.

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Section of long supply conveyor delivering parts to the assembly benches.



departments, then to storage, assembly and packing.

A few thousand feet of this extensive conveyor system are used in a compact layout for assembly of Hydrovacs. These are power braking systems that take the hard work out of applying the brakes on large vehicles such as buses and trucks. Several thousand of these items are assembled daily in an area that measures only 40' x 80'. A simplified flow sheet is shown on these pages.

#### Many Pieces-Minimum Effort

The main component partsshells and end plates-are routed from central stores to final assembly on a chain conveyor whose closed circuit is 1,200 lineal feet.

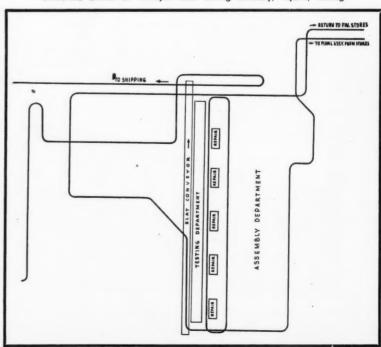
## HIGH VOLUME **ASSEMBLY**

with Conveyors

A compact layout for a highvolume item in which overhead chain conveyors supply components, serve testing and repair stations, then deliver the units to packing. A selective countina device is an unusual feature in this type of system.

FIVE MILES of overhead chain conveyors travel in Plant No. 1 of the Bendix Products Division, South Bend, Ind., carrying thousands of parts of different types for a variety of automotive accessories in a continuous flow through press, machining, processing and finishing

Condensed sketch of conveyor lines serving assembly, repairs, testing.



One operator can keep the line filled, with a second man feeding the material to the loader. The parts mentioned are delivered from plating to central stores on another chain conveyor. In the storage area, the interior of the shells is polished and then drilled and tapped for pipe plugs.

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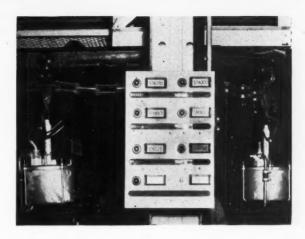
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et.

The shells are hung on one hook, the end plates on the next hook. Since six sizes of Hydrovacs are assembled (a specific type on each bench), the parts are loaded in accordance with the types scheduled at any given time. The adapter hooks are spaced on 24-inch centers, and the line travels at the rate of 30 F.P.M.

The final assembly for the braking mechanisms is in the east-central portion of the large plant, and consists of a series of assembly benches laid out in a north-to-south direction. The conveyor keeps a continuous supply of shells and end plates (for each type of unit) within reach of the operators at the lead-off station at each assembly bench, where the parts travel by at chest height.

All small parts are delivered by stock men from skid bins or tote boxes, and are arranged in trays in Panel of photoelectric counter which records separate totals of units of different



shelves are slanted, thus tilting the trays toward the operators and making for easy visibility and removal of the parts.

The work in the assembly area advances from north to south. At the south end of the benches, the operators dispose of the completed units by hanging them on the oval conveyor shown. The closed circuit of the latter is 170 lineal feet long. Its return line circles past the test stations arranged on its north side. The oval line, like the supply conveyor, also travels at 30 F.P.M. and its hooks are spaced on 24-inch centers. These hooks

double tiers on each bench. The are V-shaped, permitting the cylinder ends of the units to be suspended from the narrow end.

Each test and inspection stand is set up to handle a certain size of Hydrovac, and sufficient booths are set up to balance out production.

Adjacent to the south of the test stands is a 24-inch-wide metal slat conveyor, with channels forming 4-inch-high guard rails. The units which have passed the tests are disposed of on this waist-high line. The slat conveyor travels west, and at its end point the plugging bench is located. The operator here removes the products for insertion of the shipping plugs.

With many units being constantly placed on the slat conveyor from the test stands, a precaution is taken to prevent damage to the products at the end of the line. This is accomplished by a micro-switch mechanism which starts and stops the conveyor automatically. When a unit is not taken off as it reaches the end of the line, it comes in contact with a stop bar, which activates the switch and shuts off the conveyor. As soon as the unit is removed from contact with the bar, the line starts moving again. In this manner damage to the products is effectively avoided, which would result from "piling up" at the end of the line.

Selective Counting Device

The flow sheet shows that a chain conveyor travels past the plugging

(Turn to page 40)

View of slat conveyor alongside testing stations. It delivers to packaging line.



#### HANDLING DIES . . .

(Continued from page 26)

where the smaller types of dies are repaired and where a full die building program is carried on as well. The entire ceiling of the 125'x300' building is covered by cranes on which 23 hoisting units operate. The capacity of the latter ranges from 6,000 to 20,000 pounds, providing an economical range of capacities for the lifts of different weights.

A layout sketch of the transfer crane system is shown in the accompanying diagrammatic sketch. Each of the three bays is covered with a series of fixed lateral crane units, arranged according to the machinery layout on the floor below, with two longitudinal tracks extending over each aisle between the bays. The powered transfer cranes travel on these longitudinal tracks. Thus a hoisting unit in any of the three bays can be transferred to any bay in a matter of minutes.

In general, the machines are laid out on the floor according to a "light" to "heavy-duty" arrangement (in a south to north direction). Thus, the large-capacity hoisting units usually remain grouped over the areas where they will be required most of the time. On the other hand, transfers from bay to bay can be accomplished quickly—and safely—as often as necessary.

The numerous hoisting units are plainly marked with large numerals, which facilitates maintenance work. A unit needing attention is indicated by its number, and thus easily located.

As one of the photos shows, all hoisting units in this system are pendant-controlled. The ready availability of the 23 hoists is, of course, a distinct advantage in a department where numerous exacting machining operations are continually in progress. The hoists are in constant use for lifting, positioning and transfer tasks. Here, as in the other departments mentioned, careful handling is the watchword

#### **RULES FOR SAFE CRANE OPERATIONS**

#### Fisher Body Division (Cleveland Plant)

- No employee is to operate cranes until the safe method of operation has been explained to him by his foreman.
- Crane operators and hookers will be required to obtain permits from the Medical and Safety Departments, these permits to be renewed annually.
- Move only on signal from the proper person. See that block is directly over load to prevent swinging. Under no circumstances should bridge or trolley be started while load is on ground. Be sure that everyone is clear; ring gong; start to hoist slowly.
- If load does not ride properly when raised, sound warning bell and lower load so hooker can readjust sling.
- Floormen or hook-up men shall give all the signals to the operator, in accordance with the standard recommended by the American Society of Mechanical Engineers.
- Floormen shall be responsible for the condition and use of all hoisting accessories and for all hitches.
- Before the operator moves a crane upon which an empty chain sling is hanging, the floormen shall hook both ends of the sling to the block.
- Floormen, where necessary, shall walk ahead of the moving load and warn people to keep clear of it. They shall see that the load is carried high enough to clear all obstructions.
- When giving signals be sure you are in a position where the opera-

- tor can see you.
- Before signalling operator to travel with load, see that crane block is directly over the load to avoid swinging, and is properly balanced.
- 11. It is your duty to see that safe chains, heavy enough to carry the load, are used. Never use a chain that has stretched or a hook that has begun to straighten. Splicing chains or shortening chains with bolts is prohibited.
- 12. In piling material, be sure that it is properly placed and blocked so that it will not slip or over-balance.
- Do not ask craneman to pick up a load greater than the capacity of the crane. You will be held respossible.
- 14. Chain or slings must not be kinked, twisted or knotted while making a lift, as these are among the greatest causes of failure. Use a chain adjuster or wooden wedges if necessary.
- 15. When using a sling, the load should be distributed equally on each leg. Slings should be used with as small an angle as possible between the legs as the load on each leg rapidly increases as the angle increases.
- 16. Dragging chains over material, throwing them about carelessly or dropping them on hard materials injures the chain and is very unsafe practice.
- No chain, whether new or repaired or to which hooks or rings have been added, shall be placed in service without first being thoroughly inspected.

since a momentary carelessness may be costly.

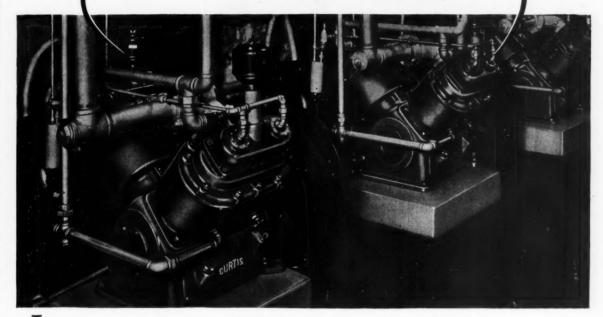
Upon completion of a job, the operator hoists the die and spots it at the end of his bench facing the aisle. The department foreman gets a ticket, and he then informs the platform truck driver (serving this building) that the die is ready for delivery to the job.

The constant availability of the hoisting units also means that there will be no machine waiting time. A quality production job depends on the precision machining performed. The push-button control feature of the hoists, in turn, makes the job easy for the highly skilled operators, who are not called upon to do any heavy lifting tasks. Whether it be a 50-pound or a 10,000-pound lift, it is made simply by pushing buttons. As a result,

operators are enabled to concentrate on their precision work.

With the hundreds of forming presses stamping out many thousands of parts daily, it is easily understood that dies needing changes or repairs cannot be kept out of circulation for long periods at a time. In fact, before a die is sent for repairs, a production schedule is consulted on the length of time it will be available to the tool room. This time limit may be as little as 24 hours. The schedules, by the way, are set up to meet those of the press department, shipping and assembly of the plants being served by the Cleveland Plant of the Fisher Body Division. The Tool and Die Department is continuing to meet its exacting schedules without any noticeable strain. In fact the big job is done with relative ease. OR AN ADEQUATE, DEPENDABLE AIR SUPPLY

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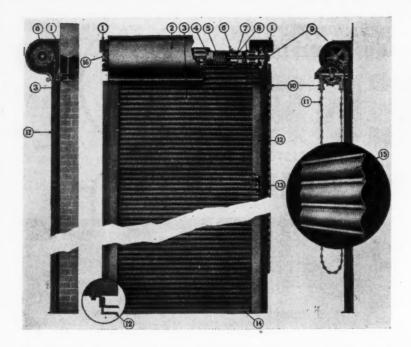
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MECHANISM OF TYPICAL ROLL-UP DOOR with hand chain operation. 1. Brackets. 2. Hood. 3. Curtain. 4. Spring barrel. 5. Counterbalance. 6. Rings. 7. Shafting or tension rod. 8. Barrel plugs. 9. Reduction gearing. 10. Chain guard. 11. Operating chain. 12. Guides. 13. End locks. 14. Bottom bar. 15. Slats, and 16. Adjustment wheel.

## OPEN THE DOOR

## for Material Flow

Modern industrial doors are gateways for materials on the move. Engineered to handling requirements, they help speed the flow of in-bound, in-process, stored and outbound materials.

FLOW articles in the past months have repeatedly pointed out the importance of industrial doors—the opening problem—in relation to the material flow lines. Such factors as their size, location, construction and operating method have a bearing on in-plant freight moving through doorways which connect adjoining departments, buildings and yard areas. Because of the relationship of doors to in-plant transportation, this article reviews

modern types of doors that are available for efficient operation.

#### Doors Are Gateways for Cranes, Trucks

In designing a plant, whether a factory, warehouse or shop, engineers consider industrial doors from the standpoint of the material flow. For example, the engineers of a metal fabricating plant laid out a new warehouse so that each of several car doors opened on an aisle. As a result, fork trucks entering the building from the cars were saved the trouble and time of maneuvering with heavy loads, and stockpiles were reached with minimum travel. The specifications for these doors provided a width of 10 feet and a height of 11 feet, which made

THIS POWER DOOR is equipped for hand chain operation in case of power failure or of emergency.

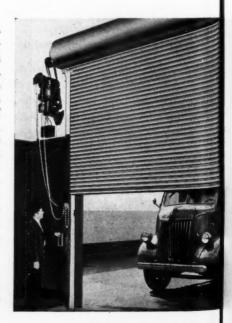
it possible to take any incoming material through any of the doorways. In the same building, a door th

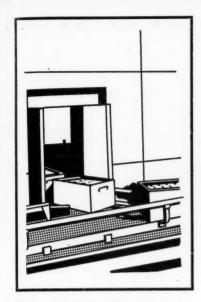
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SMALL SWINGING DOOR over conveyor helps maintain temperature, keeps out dust and weather.

18 feet wide and 17 feet high was installed in order to permit incoming highway trailers to drive through the full width of the plant.

Modern power-operated doors aid material movement and handling procedures in other ways, both in connection with on-the-floor and overhead handling equipment. A platform truck or fork, for example, travels with a load from the manufacturing department to the adjoining warehouse or shipping room. In approaching the door between the two buildings, the traveling vehicle breaks an "electric eye" beam which in turn actuates the electric operator which opens the door. A similar arrangement on the warehouse side closes the opening automatically after the truck has passed with the load.

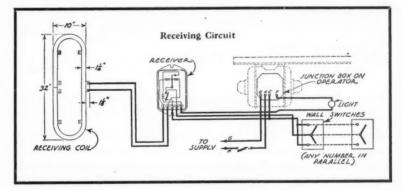
Another example is afforded by a modern steel warehouse, where an elevating door, 80 feet wide and 12 feet high, opens up above a crane runway. This push-button-controlled door, weighing seven tons, permits a traveling bridge crane to operate on a runway which extends from within the building several hundred feet over an outside storage yard.

While the motor-driven doors just mentioned are impressive for reasons of their massiveness and

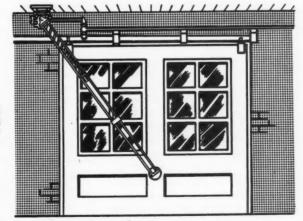


REMOTE CONTROL: Door is raised when operator on truck drives over pickup coil in driveway.

BELOW: Wiring diagram of receiving circuit of "radio control" system for operation in driveway.



automatic features, it should not be overlooked that the smallest types of swinging doors likewise pushed open by material traveling on the belt or rollers, and return to closed position when the units have



AIR - ELECTRIC mechanism on sliding door follows patented "over dead center" principle.

perform important functions in material flow operations. Built over conveyor lines, they are passed. Such simple, spring-operated doors permit continuous conveyor flow, and at the same time

help avoid temperature changes (as in a chill room) or provide effective protection for operating areas against heat, draft or dust.

#### **Doors for Specific Requirements**

The large size of present-day factories, mills and shops and the greatly accelerated volume and From the point of view of design, there are the all-vertical, the flexible roll-up, and rigid overhead sliding doors. The overhead folding type is another variant. It consists of two leaves hinged horizontally and pivoting from brackets at the top corners of the opening. Still other variations are hangar doors

apply to smaller openings as well, since they too must meet the requirements for (a) ease of operation, safety or building protection, weather protection, and durability, in addition to general efficiency in regard to plant layout and material flow.

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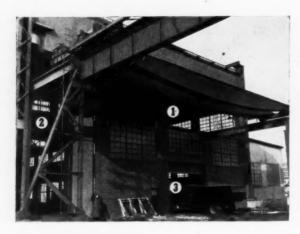
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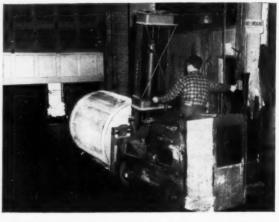
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Mechanical opening and closing



THE MEANING OF "GATEWAYS" in material flow. (1) Seven-ton elevating door for bridge of crane; (2) cab and suspended load pass through railroad door; (3) highway trucks enter here.



CONVENIENT LOCATION of three-way switch enables truck operators to open and close this door without demounting. Waiting time for men and equipment is reduced, flow maintained.

tempo of in-plant traffic have brought about a trend toward motor operation for maximum door efficiency.

Aside from the method of installation, the standard types of doors can be classed in three main groups according to their operating principle, as follows: 1. Manual, push-up, sliding or swinging. 2. Mechanically operated by hand chains working through sprockets and reduction gears, or by hand crank operated on a shaft and reduction gear. 3. Power operated types. This group includes electric and/or electronic controls as well as those using air power which is turned on electrically or by pull cord switches.

The foregoing is a rough grouping, which covers a large variety of designs and installation problems. For example, the door manufacturer or engineer is guided by whether the door is to be installed between the jambs or on the face of a wall. Such considerations, necessarily beyond the scope of the article, must be decided in relation to the structure and similar factors.

and steel rolling grilles. The choice of any particular design, whether for a single door or for a battery of them, is dependent on the kind and frequency of use, the clearance available, size desired, and similar factors. It is well to remember that a thorough study of the opening problem is necessary in order to obtain maximum door efficiency for particular requirements.

#### Manual and Mechanical Doors

The manually operated industrial door may be of the push-up or sliding type. The push-up model is usually provided with a handle in the bottom bar for ease in manipulation. Sliding doors run in a floor level track and are suspended from trolleys running on an overhead track, extending either to the right or left of the opening, or both.

Manual operation is of course confined to the smaller and lighter doors. Manufacturers recommend that their size should not exceed dimensions ranging from 80 to about 150 square feet. However, sound door engineering principles

devices provide both a speedier and easier operation for doors that are somewhat larger. A familiar example of a door with a manually operated mechanism is the roll-up type with a curtain or panel consisting of interlocking steel slats. These are usually galvanized for maximum weather resistance. When being raised, the flexible steel curtain is rolled on a beam which serves as an axis. A spur geared chain fall is attached to the axis and provides the leverage for raising and lowering. The maximum pull for a unit in this category is estimated by one manufacturer at 35 lbs. Designs of this type are offered with the chain on either side of the wall. One of the diagrammatic sketches shows the construction features of such a door.

Some plant engineers prefer a hand crank to a chain fall. In this case, too, various installation combinations are offered. The crank, shafting and gear may be on either one side of the wall or on both of them. The crank is detachable for safety reasons. The estimated

maximum exertion on the crank is 20 lbs. for a door with an area of about 100 sq. ft.

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Another type in this group are cam-operated swinging doors, which are opened by moving vehicles. As the doors swing open they lift slightly and move a two-way gravity cam which operates in a fully enclosed housing bolted to the upper portion of the side jamb and head jamb. Return of the cam by gravity closes the doors.

### **Power Operated Doors**

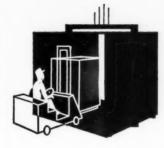
To avoid physical exertion, and to minimize waiting time for trucks and traveling bridge cranes, the larger doors are motor operated. The installation of a power operated door is also determined by the amount of traffic flowing through an opening. Space saving is an important consideration, and hence many of the doors in this group are stowed overhead when open.

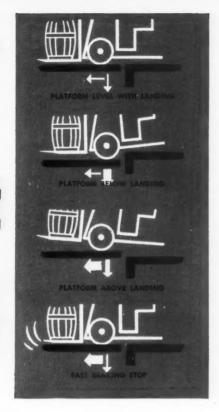
Many standard models of electrically operated doors are furnished with a three-button switch. The buttons are labeled "open," "close" and "stop," the latter being a remote control magnetic enclosed switch panel for reversing the motor. A limit switch, included, breaks the circuit at termination of travel.

Door efficiency is obtained with a travel, up or down, between onehalf to three quarters of a foot per second. Thus a power door with an opening height of 14 feet will be opened or closed in about 10 seconds. The economy of such efficiency can be readily appreciated in a plant with a half dozen or more truck doors which must be frequently opened and closed. Motor operation that is measured in seconds saves time in the flow of inbound and outbound goods. In addition, effort is saved, heat losses are prevented and general plant safety is promoted.

Material handling and production engineers pay particular attention to the location of control switches. Those for railroad or crane runway openings are usually located near the doors. In the case

# Power truck impact





**ON FREIGHT ELEVATORS** You've watched power trucks in action. They may weigh 8,000 pounds, or more, plus a proportionately heavy pay load. They're speedy, hard driven, fast stopping. They 'punish' the elevator platform and structure with a wide variety of vertical and horizontal impact forces—as shown by the size of the arrows in the diagrams above. These impact forces tend to thrust, tilt and twist the entire elevator structure.

Obviously, power truck traffic can be handled safely only in freight elevators that have been specifically designed—to take power truck impact. It's just one of several reasons why you should change your thinking about freight elevators when you change from hand to power truck loading.

FREE! OTIS Bulletin B-705F explains what happens when a power truck 'punishes' a freight elevator with impact loading . . . off-balance loading . . . and extra static loading. It shows how OTIS Pow-R-Truck Freight Elevators, with lifting capacities from 8,000 to 20,000 pounds and over, meet these severe stresses. And it also gives platform dimensions and hoistway requirements. Write for your copy. Otis Elevator Company, 260 Eleventh Avenue, New York 1, N. Y.





РОШ-R-TRUCK ELEUATORS

DESIGNED TO TAKE POWER TRUCK 'PUNISHMENT'

# CAN CUT A SAN Handling Cost to 59\$



Most material handling problems consist principally of two fundamental operations—(1) Transportation, and (2) Piling. The following simple example shows how a handling operation, costing \$38.33 by hand methods, can be cut to 59.6¢ by the use of BAKER Fork Trucks and pallets.

SIMPLE MANUAL OPERATION

\*

-DISTANCE!

ELECTRIC FORK TRUCK HANDLING

5 HOURS

TOTAL 38 3 HOURS

X - 200 FEET

PILING ON PALLET TRAVEL TIME

TOTAL

5 HOURS

S HOURS

PALLETIZED

LOAD=1 CASE

**THE PROBLEM**—To move a pile of 1000 cases a distance of 200 feet and re-pile. This problem is obviously oversimplified. In practice these operations are repeated many times and with many variations—but the ratio of savings remains essentially the same.

### COST BY HAND METHODS

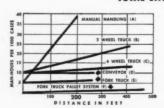
1. Transporting—Practical Load—1 case. Estimated walking speed 200 feet per minute.

Time-1000 round trips, 2000 minutes or 33.33 hrs. Labor cost at \$1.00 per hr., \$33.33

2. Piling-Estimated rate-200 cases per hr. Total time -1000 cases-5 hours. Labor cost at \$1.00 per hr., 5.0

Labor cost at \$1.00 per hr., 5.00 TOTAL COST-HAND METHODS.. \$38.33

### COST WITH BAKER FORK TRUCK AND PALLETS



How the cost of Baker Fork Truck-Pallet operation compares with still other handling methods is shown in the chart at left. The starting point of each line indicates man-hours required for piling, and the path of the line shows man-hours for increasing distances. Obviously, the greater the distance, the greater the savings with BAKER Trucks.

Let a Baker Material Handling engineer show you how similar savings can be made in your plant.

### BAKER INDUSTRIAL TRUCK DIVISION

of The Baker-Raulang Company

2185 WEST 25th STREET • CLEVELAND, OHIO

In Canada: Railway and Power Engineering Corporation, Ltd.

Baker INDUSTRIAL TRUCKS

of power truck traffic, however, the switches are usually located at a distance for the purpose of (a) elevating the door by the time the vehicle reaches it and (b) convenient manipulation by the operator so that he does not have to leave the vehicle. One of the photos shows a fork truck operator seated on the vehicle, manipulating a three-button switch.

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Another widely used switch for electrically operated doors is the pull cord type. It is mounted on each side of a door, usually overhead, so that the truck operator can reach it without stopping the vehicle. A photo on page 36 of FLOW for April shows a truck operator opening an elevator door "on the run" by use of such a switch.

Here is a typical operation provided for industrial doors with this control. By pulling either cord, the door will go to the fully open position if it is closed, or to the fully closed position if it is open. Should the door be in midstroke when either cord has been pulled, it will immediately reverse and return to the position from which it started. The accessibility of the overhead pull cord switch during travel contributes to speedy movement.



HEAVY SWINGING DOORS are operated by two-way gravity cam. Rooms are separated.

Another type of power unit, for sliding, folding or single swinging doors, is the previously mentioned air cylinder. This may be turned on by (a) an electric push-button switch, (b) a plate-type drive-way switch operated by a vehicle passing over it, and (c) pull cord control or pulley arrangement. The

latter two actuate the cylinder without electricity. At the touch of any of these switches, the air in the cylinder is released. The door is then carried to the half-open point, when the air is shut off and a spring completes the travel of the door. Thus air power starts the opening or closing, and the main spring, regulated by the checking action of the air cylinder, completes the opening or closing.

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### **Remote Control Operation**

Radio control is another means of opening and closing doors without requiring the operator to leave the vehicle. It is used in operations where electric trucks regularly travel over routes which pass through normally closed doors. This control consists of a transmitting and receiving set. Current for the transmitter coil is supplied by the truck's storage battery.

When the control button on the truck's steering rod is pressed, current flows through the vibrator and coil of the transmitter. Due to the "make and break" action of the vibrator, the current is broken up into a pulsating direct current of a fixed frequency which flows through the coil on the underside of the truck platform. As a transmitter coil passes over the pickup coil (the vehicle does not have to stop), it induces a low-magnitude alternating current of the same frequency in the pickup coil, which is connected to the two relay coils in the receiver in the building. Between these two relay coils, and subject to their alternating magnetic field, is an armature which is mounted on a metal reed whose natural vibration period is accurately tuned to the frequency of the transmitter. The signal from the truck causes the armature to vibrate and strike a contact which actuates the mechanical door opener to open the door. One of the photos shows an outside door elevating as it is being approached by a platform truck.

The closing operation is performed by a second pickup coil and

(Turn to page 54)



# CEILING STORAGE SAVES \$82,500 A YEAR

6TH PRIZE WINNER IN FLOW COST ANALYSIS CONTEST

The flow and storage idea presented in this paper pays off to the tune of \$82,500 annually—and made an investment of \$214,000 in new building unnecessary.

By JAMES E. TRASK, JR.

Division Engineer, Coated Abrasives
Minnesota Mining & Mfg. Co.,
Saint Paul, Minn.

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THE idea was developed by executives and engineers of our company, makers of all types of coated abrasives, Scotch tape, multiple recording magnetic tape, and numerous other products.

Here is a brief history of how the application of the material handling equipment shown accomplished this tremendous saving. The Minnesota Mining & Mfg. Co. needed additional storage space for the 2700-pound rolls, but at the time the government would not approve a new building. And in the postwar year of 1945, plant construction costs had risen. It cost \$8.00 per square foot to build. Another difficulty: it was desirable to maintain storage close to the processing departments, and any new building would have created a haulage problem.

Came the dawn. During discussion of the situation an executive remarked, "If we could only hang the rolls on the ceiling." This remark started a train of thought which ultimately led us to the actual solution. This was to suspend hundreds of these heavy rolls from the warehouse ceiling, thus gaining the necessary storage space near processing—without building.

The rolls are placed on steel skids, transported to location, and then elevated by fork lift truck to the ceiling hooks shown in the photos. (These trolley-mounted hooks have been previously moved to the center of the aisle.) After a

Ceiling storage space furnished—50,000 sq. ft. Estimated new building cost—50,000 sq. ft. @	
\$8.00 per sq. ft	\$400,000.00
Actual investment in steel girder track, installation, fork trucks, and miscellaneous equipment	

Table I-Analysis of Capital Investment Factors

Table II—Analysis of Cost Factors		
Savings in actual handling costs per year at \$25.00 per hook on 2,000 hooks		50,000.00
Elimination of "searching crews". Prior to this installation, three crews (one crew per shift) of three men each, were maintained, whose sole duty it was to locate the various types of rolls for processing. Yearly cost per man is \$2,500.00, and for nine men		22,500.00
Reduction in roll damage because of less handling in ware- house, former estimated cost, \$12,000.00 per year, total	•	10 000 00
saving with this installation	<b></b>	10,000.00

TOTAL ANNUAL SAVING	82,500.00
Table III—Analysis of Saving in Handling Per Roll	
Cost of storage space per roll per year \$	7.50
Cost of elevator transportation per roll per year	6.25
Cost of trucking from one building to another per roll per year	9.75
by ceiling hung storage, per roll per year	1.50
TOTAL COST PER ROLL PER YEAR	25.00

roll is hung, it is pushed on the overhead rail away from the aisle

to the proper storage position. The cost factors and savings are broken

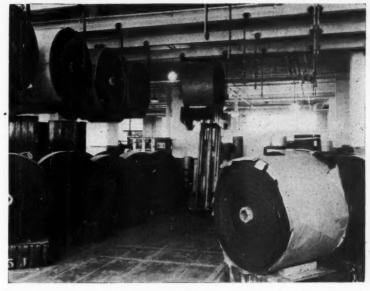
down in the accompanying tables.

### Efficiency of Present Method

An evaluation of the efficiency of the present method of storage and handling reveals several important operating improvements. The high cost of the old method of using "searching crews" to find needed rolls in various warehouses is indicated in Table II. The present method of ceiling storage maintains the stock on the floor adjacent to the processing area. The sizable reduction in damage loss, also given in Table II, is another vital improvement that sheds light on the value of properly engineered material handling meth-

An explanation should be made of why the rolls are not stored in the conventional "piling method," or in solid storage, floor to ceiling. Each roll has to be immediately available for processing at all times. There are some 1200 different coated abrasive sheets manufactured for industry today. In order to fill a great variety of orders for sheets, belts, rolls or discs, each roll is tagged as to type, grit, and material, and must be instantly accessible when needed.

The reduction in damage loss figured importantly in the savings. It is readily understood that less handling results in less damage. Formerly, rolls came from the



THE HEAVY ROLLS are hung by fork truck on the trolley-mounted hooks, which are moved to aisle.

"maker" and were stored wherever space was available. This was both in company buildings and in rented warehouses. As needed, they were located by the searchers and then trucked in various ways to the processing areas. Any damage to the outer edges of the roll entails the unrolling and discarding of varying amounts of the material, plus the cost of the time involved.

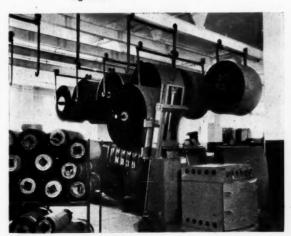
### **Engineering Cost**

An interesting aspect of this problem was the negligible amount

of engineering cost involved. First of all, a study and tests had to be made to make sure that the building was capable of taking the added weight and strain. The designing of the ceiling girders and track, plus the laying out of the "storage bays" were next made and a test bay completed and tried before proceeding with the entire project.

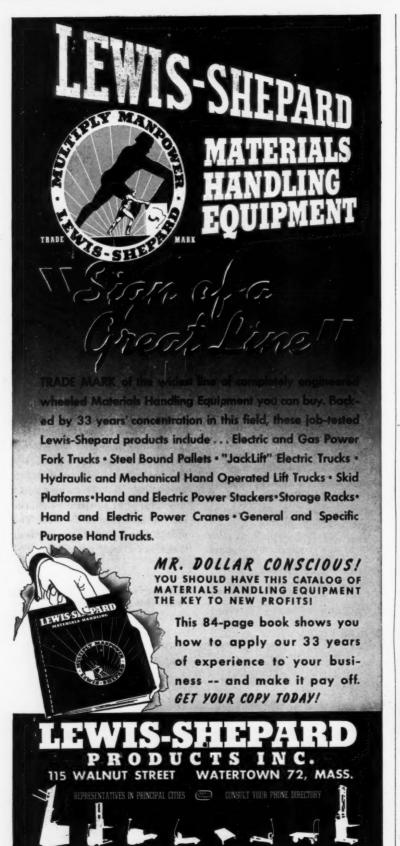
A total of \$1,800.00 for engineering expense covered the cost. This amounts to less than one per cent, which is certainly a good figure.

WHEN NEEDED FOR PROCESSING, rolls are easily removed from hooks. Accessibility is big factor.





ANOTHER VIEW OF empty and loaded hooks. Note the angle storage, neatness, use of overhead space.



### (Continued from page 29)

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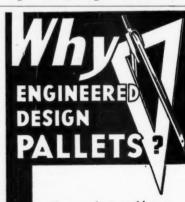
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bench. The operator hangs the plugged units on this line for delivery to the packing department, and on the way they are counted by an ingeniously designed photoelectric device. Its unusual feature is that it counts the products on a selective basis. That is, they are not merely counted for one grand total, but Hydrovacs through the full range of six sizes are each accurately counted and separate totals recorded. The battery of photo-electric cells is located overhead along the conveyor's line of travel, the individual cells on slightly different levels in accordance with the lengths of the vari-

ously sized units.

The panel containing seven signal lights and counters (one is a spare) is located on a post at eye level, about 50 feet from the photo-electric cell unit. When any size Hydrovac traveling overhead breaks a light beam, a light flashes on the



If your plant could operate more efficiently with better materials handling, pallets are worth your investigation.

ENGINEERED DESIGN pallets can solve specific materials handling problems because they are designed for just that purpose . . . to handle your product the most efficient way.

Pallets Incorporated

ENGINEERED DESIGN Pallets
GLEN FALLS, N. Y.

dial allocated to that particular unit, and the count and registration is made.

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To further insure the accuracy of the count, a cut-off switch is provided in the packing station at the end of the line. This switch automatically stops the conveyor in the event the packers allow units to remain on the line and pass by. Thus a foolproof count is obtained of each type of Hydrovac produced and sent to shipping daily.

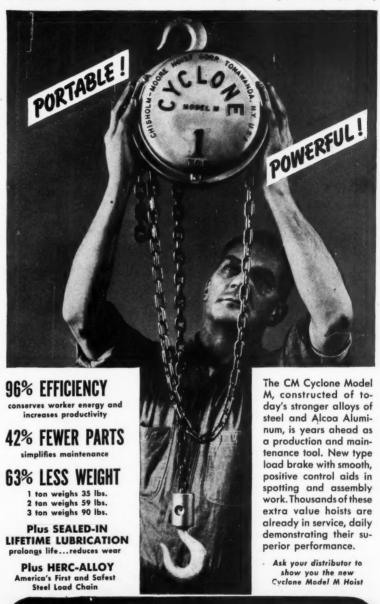
Two hundred feet south of the photo-electric counter the conveyor dips to working height in the packing department. (The same line has sufficient hook capacity to dip, first, at another station where gear shift assister parts are assembled. These units are hung on the line and are carried by it beyond the Hydrovac packing station to another packing department.)

As the Hydrovacs are taken off they are placed on a metal table that is parallel to the line. At right angles to the table are several packing benches, one for each size of Hydrovac. The layout includes a 10-foot section of gravity roller conveyor for each bench, whose level is 12 inches below that of the latter. This arrangement permits the packers to lower the units into the corrugated shipping containers from the benches. At the end point of each conveyor line the packed products are skidded and then moved by powered platform truck to the shipping department.

In the large plant of Bendix Products Division a number of Hydrovacs are also routed regularly (not boxed) to the Service Sales Department some 1,200 feet distant from this point. For economical handling in quantity the units are tiered three high by use of the tray pack method, as shown in one of the photos. Usually one band of ½-inch steel strapping is sufficient for purposes of intraplant movement. This tray pack handling makes for a neat and economical operation, and is also convenient for temporary storage purposes. At the same time the products, covered with the trays, are adequately protected against damage.

# TEN CYCLONE

Model M • HEAVY DUTY HIGH SPEED HOIST • Capacities from 1/4 ton up



# CHISHOLM-MOORE

HOIST CORPORATION

(Affiliated with Columbus McKinnon Chain Corporation)

GENERAL OFFICES AND FACTORIES: TONAWANDA, N. Y.
SALES OFFICES: New York • Chicago • Cleveland • San Francisco • Los Angeles

See Us at Booth 116, National Safety Congress, Stevens Hotel-Oct. 18 to 22-Chicago

### ON THE



### PALLET

### NEWS · VIEWS · TRENDS

THIS one is designed to keep you out of the soup, that is, if your soup comes in cans. A General Electric magnet is attached to an adjustable arm on a new wall-type can opener. After the opener has snicked the lid off, the magnet snaps it up and holds it until the can is removed.

THE G. B. LEWIS CO., Watertown, Wis., this year is celebrating its 85th year in the manufacture of precision wood products. Today the firm has its main factory, office and lumber yards occupying a 12-acre area, as compared to the small wood-products factory powered by a single waterwheel in 1863. The company produces woven wood-and-wire industrial containers, propellers for light planes, venetian blind slats, golf ball washers and wooden bee ware.

TOWMOTOR CORPORATION'S quarterly publication, "Handling Materials," assumed an entirely new format in 1948. The company manufactures fork trucks and accessories and industrial tractors. Devoted exclusively to material handling, the publication is now to be known as "Handling Materials-Illustrated." Changes in the publication include a tabloid format, brief copy, with more space being devoted to sequence photos of actual handling operations.

SERVICE ENGINEERS from 40 states and three foreign countries attended the Thew Shovel Co.'s Distributors Service School operated at the Lorain, Ohio plant. The school, which was established originally during the war to train military personnel, is open to service engineers from Thew's distributor organization. Its purpose is to provide the best possible field service for Lorain users, and to make factory trained service personnel available to them. The course includes a study of power crane and shovel engineering, design, construction and service.

A NEW 2300-FOOT conveyor belt which will move more than 700 tons of iron ore per hour has been installed in a mine operated by the Cleveland Cliffs Iron Co., near Hibbing, Minn. The iron ore weighs 150 lbs. per cubic foot and the belt travels at an incline of 16 degrees from the bottom of the pit to storage bins outside the mine. The steep slope and the relatively heavy weight of the material to be carried, necessitated the special belt, which is manufactured by the U. S. Rubber Co.

THE FIRST WESTERN CONFERENCE on packaging, packing and shipping will be held concurrently with the first Western Packaging Exposition, at the San Francisco Civic Auditorium, August 10-13. The exposition will bring together for the first time in the west over 100 major companies engaged nationally or regionally in the manufacture or distribution of equipment, machinery, materials or packaging supplies. Kenneth K. Dean of San Francisco is general chairman of the exposition, and Dr. William Rabak is conference program chairman.

S ELLERS OF electric material handling trucks and batteries are becoming more conscious than ever of the importance of efficient battery charging methods. This fact has been derived from the success of the latest of a series of district sales meetings conducted by The Hertner Electric Co. The Chicago meeting was attended by 75 salesmen of manufacturers of material handling equipment, and 84 salesmen participated in a similar meeting in New York.

A DDITIONAL DATA on the manufacture of sintered magnets by the Deutsche Edelstahlwerke. Krefeld, Germany, are contained in a report now on sale by the Office of Technical Services, Department of Commerce. The report was prepared by the OTS following an investigation in Germany early in 1947. Five related reports on this subject have been previously released by OTS.

W ESTINGHOUSE ELECTRIC CORP. announces that its price reductions since the first of the year total more than \$14,000,000 on household and industrial electrical equipment. Reviewing the company's pricing policy at the meeting of the board of directors, Westinghouse president Gwilym A. Price said the price reductions "average about five per cent of the products affected." They have applied to products of seven major manufacturing divisions.

A N AMAZING MACHINE that assembles radio sets without human help is now in operation in a factory at Walton in Thomas, England. The parts are fed into one end of the 70-foot electronically controlled robot, and the complete sets come out the other end at the rate of one every 20 seconds.

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# **How Shipper** Saves 530 per car

Acme methods and Unit-Load Band help chemical shipper roll up substantial savings in time and materials on car load shipments.

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Eastern Gas and Fuel Associates, Everett, Massachusetts, market a by-product of coal (ammonium thiocyanate flakes) widely used in the chemical industry.

Carload shipments call for loadings of two hundred barrels, 200 pounds each, double and triple decked.

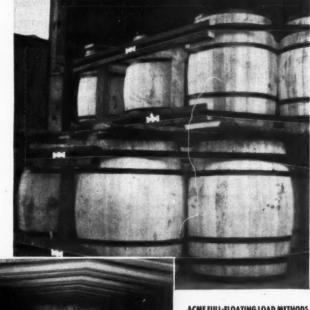
By using Acme full-floating load methods and Acme Unit-Load Band in place of the previous wood bracing method, this company saves approximately thirty dollars in time and materials on every car shipped.

This is just one instance of our ability to help get substantial savings for shippers. Whether you ship by the bag, box, or barrel, ask an Acme Shipping Specialist how we can help you. Or clip and mail the coupon for free booklet of actual case histories.

STRAPPING DIVISION

ACME STEEL COMPANY

acme Steelstrap



### **ACME FULL-FLOATING LOAD METHODS**

with Acme Unit-Load Band mean an easier "ride" for shipments, less shock damage in transit, safe arrivals. These pictures show double-decked carload of barrels of ammonium thiocyanate flakes on its way to be used in making insecticides, adhesives, and dye fixatives.

### MAIL THIS COUPON NOW

Acme Steel Company, Dept. F-78 2838 Archer Avenue, Chicago 8, Illinois Please send me a free copy of your booklet, "SAVINGS IN SHIPPING."

Company\_

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ACME STEEL CO. CHICAGO

# Seven Ideas for a profitable load unit operation

EKCO Products Co., Chicago, has adapted fork truck handling, in conjunction with the pallet and tractor-train method, to its entire operations. No less than 1500 different types of items are involved. The result is an exceptionally flexible material handling program that provides the following advantages.

1. No operator need strain his muscles because job requirements do not call for physical lifting.

2. Full utilization of headroom in raw material and supplies storage.

Smooth supply to production from two detached warehouses and outside stockpiles.

4. Maximum machine-hour produc-

tion from fork trucks by use of the depot or two-way haul method.

Instant disposal of finished goods from end of production lines with minimum use of power equipment.

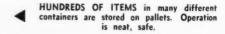
6. Efficient handling of packing materials in quantity.

7. Quick, effortless disposal of scrap, with a minimum of manhours in loading gondola cars.

By I. M. FOOTLIK

Supervisor of Material Handling and Warehousing, EKCO Products Co., Chicago

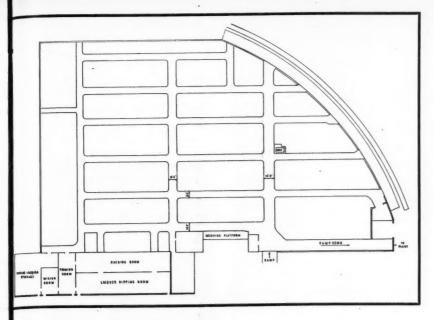
Our company is one of the oldest producers of housewares (kitchen tools) and bakery pans, and the items manufactured amount to scores of different lines. This wide range of products involves hundreds of different raw materials and supplies, ranging from small rivets in cartons and wooden piece parts in bags to bundles of steel weighing 8,000 pounds each. To this must be added a variety of carton flats and related



TRACTOR TRAIN hauling load to main plant. Note the angle iron racks used for wire coils. They are also discussed in department "Idea Conveyor" on page 67.







Flow plan of new warehouse, which was designed for modern handling methods.

our company's packaged crating

lumber operation has been detailed

in the January issue of FLOW

packing materials.

Magazine.

Incidentally.

parts and operating supplies is a half block to the east of the main plant, and the tractor-train method is used for transfer of the tonnage between these two buildings. As the flow sheet on these pages shows, the warehouse is curved at the extreme west end to conform to the contour of the property and the railroad siding which enters our yard at this point. Material handling was the primary consideration in designing this one-story, 90,000 sq. ft. building which has unlimited



FORK EXTENSIONS are used for bulky bags of handles, stacked on 4' x 5' pallets.

floor load capacity.

Along the curved section the building has reenforced pilasters for the addition of a canopy over the car dock. The doors and aisles are designed for ready access and movement of all transportation equipment within the plant. This not only means tractors and fork trucks but highway vehicles as well. Materials received by truck or trailer can enter the warehouse over the ramp at the north side via the 12foot aisle indicated, and deliver such stock closest to the storage point. This door is 18 feet wide and 17 feet high. If necessary, the highway vehicles can drive straight through to the car dock. Note that the scale is located at the intersection of two aisles. This location avoids extra truck travel for materials to be weighed. Every car door opens on an aisle, which holds fork truck travel at a minimum. The car doors have a width of 10 feet and a height of 11 feet, and thus any type of material can be taken in through any door.

Arriving material is inspected (and a receiving report is made out) and is palletized for power handling within the warehouse and to the main plant. The main plant

### Warehouse Designed for Handling

The present description covers our two detached warehouses, the main plant, as well as some yard handling in connection with our scrap metal storage and car loading operations.

Our warehouse for steel, small



FLOW . JULY, 1948

foreman requisitions material from the dispatcher, who prepares the material delivery ticket, which is taken to the warehouse by the tractor operator. Packing supplies from the second warehouse mentioned are requisitioned similarly, and details of this handling will be given at the proper place.



RAM ATTACHMENT is slipped over forks for coil handling from cars. All lifting is mechanically.

As indicated in the introductory statement, all operations are designed to avoid physical effort on the part of the men, to make jobs as easy as possible. For handling wire coils from the cars, for example, a six-foot ram is slipped over the truck forks. The truck operator picks up to a dozen coils for transfer to the warehouse. These are delivered in channel iron racks (eight to a rack) to production, as shown in one of the photos, by tractor-train. In the main plant, the rack loads of wire are spotted alongside the machines by fork truck. Thus ample material is supplied to the operations and no physical exertion is necessary.

In the warehouse, empty racks must necessarily be shifted about for transfer and loading purposes. It would be wasteful to have the heavy power equipment move these relatively light units; it would be equally wasteful (of manpower) to have operators lug the racks. Our solution of this problem is described in the department "Idea Conveyor", which appears on page 67.

Two-wheel barrel trucks are another example of auxiliary equipment used to make jobs easy for the men. We receive a considerable amount of material in 55-gal. drums. By use of the trucks provided, the operators exert a minimum of effort in picking the drums up in the cars and wheeling them to the pallets spotted on the dock. Because of the variety and different weights of the materials handled, two 6000-pound trucks are synchronized in transporting, stacking, detiering and loading the bundles on the trailers bound for the plant.

Fork extensions are another handy attachment variously employed. These enable the operators to handle relatively light and bulky loads on extra large pallets. An example are turned wood handles for kitchen tool assemblies, shown in the photos. These small items, from one to four inches long, are stacked on 4'x5' pallets. The fork extensions provide the necessary support for these load carriers.

### Pallet Sizes

A word about our pallet sizes, of which there are five. These several sizes are the minimum on which we could standardize. They were of course determined by considerations of effective utilization of storage and manufacturing space, as well as the most economical delivery of load units to the main plant. The five sizes are used for the fol-

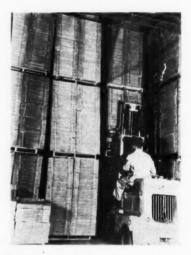


BOX PALLETS aid housekeeping, inventory of items used in small quantities. And cube is used.

lowing materials. 1. As mentioned, the 4'x5' pallet is for the relatively light wood handles in bulky bags.

2. A 36"x40" for finished goods in cartons. We found this size best adapted to all sizes of containers. 3. A 24"x38" for rolls of wire screen, which we use in considerable quantity. Nos. 4 and 5 are 32"x36" and 24"x48" for knock-down cartons.

Equally important are provisions for storage of small parts used in



CARTON FLATS are stacked to permissable limit. See article for details on unloading operation.

small quantities. For this purpose we use the box pallets (or pallet racks) originally designed for the armed forces, also shown in the photos. The outside dimensions of the racks are 45" long, 30" wide and 30" high. The pallet loads of items are supported on the racks, giving access to the material stored in any layer when small quantities are periodically withdrawn.

All flammable materials are confined to the other warehouses mentioned previously, in which all carton flats are stored. These items are received in bulk in trailer loads and are likewise palletized. At the start of the unloading, the empty pallets are placed on a portable gravity roller conveyor which is rolled up to the rear of the delivery vehicle. When its back end has been sufficiently cleared, a roller conveyor section is laid on the trailer bed for spotting the empty pallets. The loaded pallets are thus advanced to the rear of the trailer, where they are picked off by fork truck for transfer to the adjacent warehouse. The net of this method is (1) that the trailer operator saves time and effort which would be required for walking back and forth in the 35-foot-long trailer body and (2) we can handle these items economically in quantity with our power equipment.

### Engineered for Flexibility, Economy

The fork trucks of various capacities, the auxiliary equipment mentioned and the fork attachments, all spell flexibility and economy in handling the great diversity of materials. For this reason, we also use two different sizes of trailers, the smaller ones being employed in congested work areas. The beds of these latter units are 36"x72" while those of the larger ones are 48"x96".

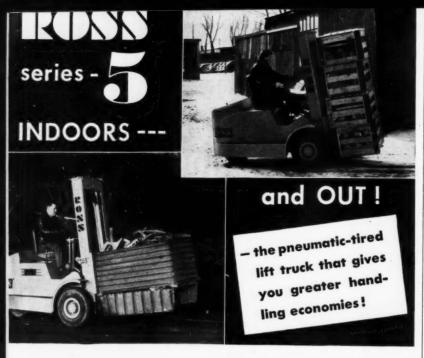
The tractors haul the trains to the first-floor distribution point in the main plant, which is located immediately within the door facing the warehouse. Here the trailers are uncoupled. Those destined for the second floor of the two-story plant are spotted near the elevator. All materials on both floors are delivered by fork truck to the department or machine where they will



SCRAP HANDLING is likewise a neat, safe operation with revolving-head truck. One man loads this gondola car in six hours.

be used. The handling of wire coils has already been described. Full pallet loads mean both an ample supply of material and a minimum number of deliveries to be made by





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These advantages, plus Series 5's revolutionary tower design which permits 78% better visibility, are but a few of the reasons why it will pay you to investigate ROSS Series 5 Lift Trucks for your operations. Get all the facts.

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the powered equipment. Economical use of this equipment is a rule enforced throughout our operations. For example, a fork truck delivering raw material to a department will take out a load of finished goods or metal scrap and deliver it to the next depot.

### **Depot System**

An explanation of our depot system will make this part of the operation clear. All movements within the plant are between depots, assuring that fork trucks will have a payload going both ways. Depots are marked areas located strategically throughout the plant along truck aisles. Their location is also designed to enable production operators to dispose of stampings and other work-in-process by moving it short distances. From here, the loads are handled by fork truck on the longer inter-departmental hauls. When a truck has delivered material to a depot, the operator picks up a waiting load and delivers it to the next depot indicated on the move ticket, and so on. In other words, there is a payload both ways. As a result, gasoline consumption was cut 30 per cent and the same trucks were able to handle 50 per cent more tonnage.

The fork trucks are likewise the "prime movers" within the production departments, where this equipment performs all heavy lifting tasks. For example, sheet metal is thus positioned at the presses for subsequent one-at-a-time handling by the press operators. If a department is large, a fork truck will be assigned to service a battery of presses exclusively.

Every production and/or assembly department has its own pallet station, either to spot empty pallets or to take out full pallet loads of finished products. In order to keep completed loads of finished products rolling out of the way, we attached swivel casters to some pallets, transforming them into dollies. The details of this operation are also given in the "Idea Conveyor" department of this issue.

Scrap handling is likewise a fork

truck operation. From the stamping presses the scrap is discharged into standard 40"x26"x34" containers (see photos), which have fork sleeves welded to the bottom. The full containers are tiered three high in the paved yard which is flanked by a railroad track on one side and which is at car floor level. When a gondola is to be loaded, a truck with revolving head is used.

Since the reach of the forks must be "stretched" to load the far side of the car, the fork extension is attached for this operation, thus enabling the truck operator to load both sides. The far side of the gondola is loaded with the lighter scrap because of the greater distance of the load from the point of support. The usual procedure is to discharge loads alternately on the near and far sides. One fork truck operator can load a car in six hours, without exerting himself. Another advantage is that the scrap is distributed evenly throughout the car. This in turn eliminates the additional effort on the part of a man climbing over the scrap and straightening it with a pitch fork. Highway vehicles are loaded by the same method.

This is how we adapted fork truck handling to our many and varied operations. Like most plants throughout the country, we are trying to catch up with a large backlog of orders, and our mechanical handling operations are making it possible for us to move a maximum of material with a minimum expenditure of manhours and effort. As a result, we are able to concentrate all available help on production. And, while production departments are smoothly and efficiently served, the overall job of raw material and finished goods handling is getting done with the greatest possible safety to men, materials, and machines.

### Win Part Of \$1,500!

The second Flow Cost Analysis Contest offers cash prizes totaling \$1,500. Individual awards, amount to \$500, \$300, \$200, and five \$100 prizes. Write for your entry blank to FLOW, 124 Ontario Street, Cleveland 13, Ohio.



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# TOLEDO

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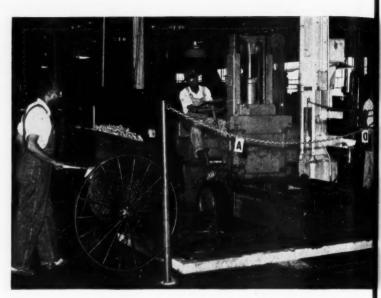
**HEADQUARTERS FOR SCALES** 

### OLD BUILDING...

### Modern Chip Handling

This chip handling program was successfully adapted to an old plant. The savings paid for the equipment in less than five months.

ONE or the most common problems confronting the material handling engineer in metal working industries is the disposal of turnings and borings. Newly built plants usually have completely mechanized systems built into them for this purpose, but the older plants were built before the advent of flow engineering. In the latter, the task of chip disposal often poses an especially difficult problem. The



Chip accumulation pit in a machine shop. Note fork truck lowering empty chip box into pit.

application of modern equipment and methods to such a layout calls for some ingenuity.

### Too Much Leg Work

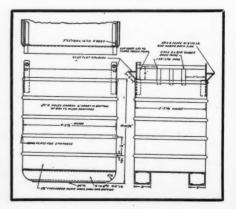
The method developed by the Hughes Tool Co., Houston, Texas, manufacturers of oil well drilling equipment, is noteworthy for this

reason. Three 150-foot wide machine shops totaling over 1600 feet in length are used for the manufacture of the company's products. The problem was to economically handle and transport 1834 cubic feet of steel shavings per eight hour shift from the shops to the storage pits. These pits are located at the

Fork truck and trailer work as a team. Operator hitches and unhitches trailer from seat.



Sketch of pallet box that can be handled with a fork truck from either bottom or top.



far end of the first building. To aggravate the situation, it was necessary to segregate four different types of shavings.

The original method involved the gathering of the chips from the individual machines into small carts. These were wheeled out of the shop and the material was shoveled into large side dump tractor-pulled trailers for delivery to the storage pits. Besides the shoveling effort, this meant long hauls of small loads to the outside disposal area. When delivered to the pits, the side dump trailers were dumped by the tractor driver. (The scrap is later loaded by an overhead traveling crane into gondola cars for shipment.) In analyzing the functions of the operation, it was found that while the layout of the machines within the shops made hand chip gathering mandatory, the subsequent functions could be revamped. The object was to provide special-purpose equipment which would eliminate miles of walking as well as the need for shoveling.

### Tough Problem, Neat Solution

To reduce the distances the chip gathering carts had to be moved, six conveniently located pits were constructed within the shops. These were designed with drain outlets at the bottom so the cutting fluids. drained from the chips, could be removed with sump pumps and directed back to the coolant storage tanks. Pallet boxes were designed to fit in the pits and to receive the chips. The boxes can be picked up by fork truck from either the top or bottom (note the detailed sketch). To set the pallet box into the pit, or remove it, the fork truck picks it up through the openings provided in the top. Subsequent handling is done on the forks in the customary way. The box has flared sides at the top, which facilitate the dumping of the carts and prevent chips from falling into the pit. The truck used, a revolving head type, is equipped with a 54-inch fork for convenient handling of the 501/2inch boxes.



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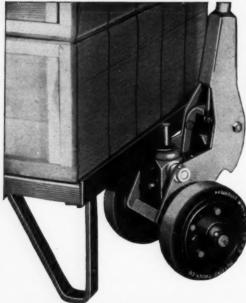
From the pits in the shops, one operator does the job with the aid of the fork truck, a trailer and a



Revolving fork truck dumps load of steel shavings into bin with aid of deflector plate.

deflector plate mounted on a stand. A trailer large enough to carry two of the large pallet boxes was provided.

(Turn to page 55)



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FIG. 421. Standard Industrial Skid. 9 platform sizes from 24" x 48" to 42" x 72." Capacity 1800 lbs. Metal or Rubber Tired Wheeis.



1602 DIVISION STREET, FARIBAULT, MINNESOTA



FIG. 420, Heavy Duty Industrial Skid, 9 platform sizes as above. Welded angle steel frame. Capacity 2800 lbs. Metal or Rubber Tired Wheels.

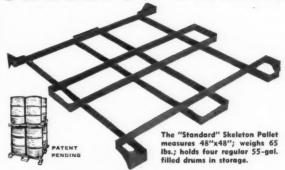






### Now! an all-steel pallet designed for use with Lift Trucks...

SKELETON PALLET



The welded steel construction and semi-open framework of the Skeleton Pallet make it ideal for use in palletizing and

depalletizing with fork lift truck, or by hand.

The "Standard" Skeleton Pallet (above) is designed especially to accommodate oil drums, barrels and rectangular types of firm containers.

It combines light weight, durability, low first cost and low upkeep; measures 48"x 48" overall; weighs 65 lbs. Skeleton Pallets are available in several sizes or can be built to your specifications, if

desired. Write for literature.

### PACIFIC CHAIL & MANUFACTURING COMPANY

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### OPEN THE DOORS . . .

(Continued from page 37)

receiver which actuate the same mechanical door opener to close the door. The second pickup coil is embedded in the floor 10 to 20 feet inside the door at a point where the truck passes over it. (These coils, one on each side of the opening, serve to both open and close the door.) The operator again presses the control button on the steering

column, and the door is automatically closed and locked behind him. The locking action is performed by a special mechanism.

This system does not require a door man, nor need the truck operator stop the vehicle. This type of door operation is in use on outside and inside doors.

Whether for side sliding, folding, all-vertical or the flexible roll-up type of doors, including swinging doors and gates of single leaf or multiple leaf design, a large variety

Horizontal and vertical wheel units

alternate in a continuous chain trav-

eling through rectangular steel tubing.

Complete flexibility. Easily installed,

SAFE—all moving parts fully enclosed.
 Low first cost. Low power factor.

• Load capacity: Single suspension 65

125 lbs.: 250 lbs. per foot maximum.

-two-foot radius. (Stock load pendnts including automatic turning

units available.

of powered operators is available for standard and special applications. Decades of research and development have resulted in compact, sturdy units that can be applied to new construction as well as to existing doors. For best results, qualified door engineers should be consulted. This also applies when considering such special equipment as a governor safety device, emergency release, or special locking mechanisms where certain safety precautions are desired.

h

o

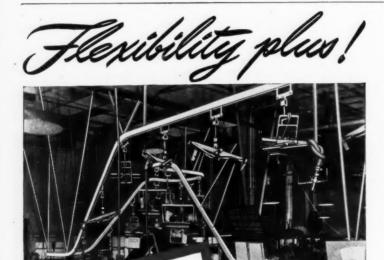
### Fire Protection, Personnel

Fire doors and other types of safety doors are considered a distinct category. They may be of the manual or automatic type. Both of these are here mentioned briefly because of their special-purpose features. Like mechanically operated and manually controlled doors, fire doors are available in a variety of designs, including those for chain hoist and crank hoist operation. A familiar type is the normally open fire door, whose drop hood is held up in open position by a fusible link attachment. The link melts in case of a fire, causing the door to close and thus forming a screen against flames and gases. Thermostatic release devices are likewise used, also arrangements in which doors are closed automatically in conjunction with the plant's automatic fire extinguishing equipment.



SAFETY DOOR to X-ray room in electro-alloys foundry has ½-inch coating of lead.

An example of special-purpose safety doors for protection of personnel are those used in operations involving high-voltage X-ray machines. For example, the X-ray inspection rooms of an electro-



Flexibility... in and around, up and down
... speeds from 1 inch to 60 ft. per minute
... unit loads up to 250 lbs. Simplicity
... a steel, tube-like track through which
travels a specially constructed chain "just
like water through a pipe." Those are two
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maximum efficiency at lowest cost for production lines.

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alloys foundry are equipped with motor-operated doors whose aprons have ½-inch-thick covering of lead for protection of employees against X-ray beams. The doors are tied in with the power system of the X-ray machines in such a way that the X-ray equipment cannot be switched on unless the doors are closed. Nor can they be opened while the machine is in operation.

Thus, from the material handling standpoint, the problem is one of "opening the door" to the material flow. Careful consideration of door efficiency will save physical exertion and vehicle waiting time, promote plant safety, health of operators, and efficient material flow. Consultation with door engineers will result in the selection of doors that will also satisfy the requirements for space saving, durability, and weather-resistance. All of these factors have a part in door efficiency.

### **ACKNOWLEDGMENT**

The data and photos appearing in this article were furnished through the courtesy of the following companies: Kinnear Mfg. Co., Barber-Colman Co., Schoelkopf Mfg. Co., The Stanley Works, and Jamison Cold Storage Door Co.

### CHIP HANDLING . . .

(Continued from page 52)

These two pieces of equipment work as a team. At the beginning of each shift, the operator starts off with it and three empty pallet boxes. At each of the pits, he removes the loaded box or boxes and places them on the trailer, and then spots the empties. When the three full containers have been picked up, the fork truck trailer train starts for the chip storage bins. (One box is carried on the forks.) Since the travel distances range from 300 to 1600 feet, they are sufficiently long to make the use of a trailer economical (over and above the handling of single boxes).

Since a considerable amount of coupling and uncoupling of the trailer was required, semi-automatic couplers were installed. They enable the operator to couple and uncouple without dismounting.

### Ingenuity Overcomes a Space Handicap

At the storage bins, it was found that the aisles were too narrow for the truck to head into the bins at right angles. To remedy this drawback, a skid-mounted deflector plate was made, which is picked up by the truck and positioned adjacent to the bin to be loaded.

The truck operator picks up the pallet box by inserting the forks into the box-like runners, elevates it over the deflector plate, and then revolves the container to unload the chips. The material hits against the plate and is discharged into the bin without spillage.

This method is less than onethird as costly as the former operation and the cost of the equipment required was written off in 18 weeks. This example of the Hughes Tool Co. shows that a correct application of modern handling facilities, preceded by a careful analysis, can save money and effort in an old plant as well as a new one.





... and this, also, is well worth remembering. It is important to you because "part of the product" engineering provides for the better and more economical packing and shipping of your products.

It assures lightweight, compact, extrastrong containers that are designed specifically to the product. It means that the container and the product can frequently move down the production line together -as a unit.

Our engineers will be glad to help provide a better container for your product. Write today. Also request your copy of the new issue of "The General Box."

\*The ringing war-cry of Sam Houston's men at San Jacinto; in memory of the 180 gallant Texans who died with Cols. Wm. B. Travis, James Bowie and Davy Crockett, at the "Alamo













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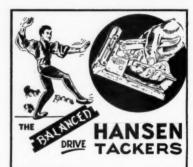
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IT'S no trick with Hansen, with its Balanced Drive, to tack more labels or tags or line more boxes, in less time, with minimum effort, and keep shipments on the go.

Faster and safer than hammer and tacks-neater than glue with its goo-Hansen quickly and securely labels shipments, for neat appearance and safe arrival.

Alike in shipping, assembly or production, the zip-zip action of the Hansen Tacker, light weight and easy portability, speed up all kinds of jobs that require tacking or fastening.

A. L. HANSEN MFG. CO

# PACKAGING MECHANICS SECTION

A regular monthly section in which are presented solutions to the problems of efficient filling and handling the boxes, cartons, bags, bottles, cases, etc., used in commerce and industry.

### CONTENTS

# For Packing Efficiency

Container design has a vital relationship to packing efficiency. Here are a few examples that demonstrate the importance of simple design, quick, easy loading of items, product protection, among other features.

By D. R. BOWDEN Industrial Packaging Engineer Hankins Container Co., Cleveland

M ODERN material handling practices and recent trends in product design have given new emphasis to the importance of properly engineered containers. New materials and new products are making their appearance on the market. New manufacturers in various fields need information both on efficient containers and on packing practices keyed to today's high-speed production methods. Modern power handling calls for sturdy cartons. In addition, the user's ideas regarding attention value of the package cannot be neglected. The material handling engineer and the packaging engineer are primarily concerned with efficient packaging production, containers that will provide adequate product protection, and which, having a minimum amount of inner packing, can be quickly assembled.

On these pages are given a few samples of carton and packing design for the guidance of the material handling engineer. They illustrate the many uses to which corrugated containers can be put in solving packaging problems posed by a variety of products.

The packaging engineer must build the container around the product. When a manufacturer submits his problem, the starting points for the designing engineer are (1) weight of the product, (2) size of the product, and (3) the customer's ideas as to specific requirements. Further consideration must be given to the type of

container-whether it is to be an individual shelf package, a display shipper (for point of sale advertising), or a standard shipping carton. The examples in this article show that the problem of each product must be solved on an individual basis. Note that the selection of the ideas presented here ranges from a container designed for flower cuttings weighing only a fraction of an ounce to one engineered for a product weighing slightly over 300 pounds.

### Floating Container With Knobs

A housewares manufacturer produces a highly polished aluminum cocktail shaker which has two lucite knobs, one near the bottom of the cylinder and the other near the top, on opposite sides. The package had to afford protection both for the highly polished metal finish and the knobs. The manufacturer also required a distinctive package, and one which could be packed with minimum effort and labor cost.

Figure 1 shows a cross-section of the special reverse tuck, die-cut, corrugated carton that was developed. The special feature is the inside die-cut top and bottom flaps. The latter are extended so as to anchor the item in the container. Note that the circular slot at the end of each flap grips the stake post on which the knob is mounted. With the help of the die-cut tab on the flaps, the

item is "floated" in the center of the carton, leaving an air space of approximately one half inch between the knobs and the sidewalls (or about two inches from the cylinder).

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Another point is worth noting. Since the carton is identical at both ends, it makes no difference from which end the shaker is inserted by the packing operators. This contributes to faster packaging. The container has been in use a number of months and the manufacturer reports complete satisfaction.

Various adaptations of the reverse tuck container are available for similar packaging requirements. Examples of items include the more valuable pieces of pottery and glassware, which must be "floated" for maximum protection.

### Wet Plants in Cardboard

Figure 2 illustrates a solution devised for shipping chrysanthemum cuttings (small young plants). This problem was entirely different. Not only were the plants extremely fragile, but it was necessary to develop a container which would resist moisture and provide adequate ventilation. These small plants were shipped from a midwestern state to every part of the country by all types of public carriers.

Since the roots of the plants were wrapped in moss which was saturated with water, the corrugated container which was subsequently engineered was fabricated with a water-resistant adhesive, and the liners and the inside packing were laminated with the same adhesive. In order to maintain sufficient air supply, the interior packing contained an air cell around the inner walls of the carton. The outside top flaps were shied (cut short so as not to butt), which provided an opening that admitted air and permitted expulsion of heat which built up in the container during shipment.

In the design of the partitions which created the cells, the pieces across the width were full height in order to support the top flaps. Those traveling the length of the carton were shied to permit circulation of air within the container. Each cell contained 25 plants. It was necessary to stitch the manufacturer's joint of this carton to promote maximum moisture resistance. This laminated container met the somewhat unusual requirement successfully and was furnished in three different sizes.

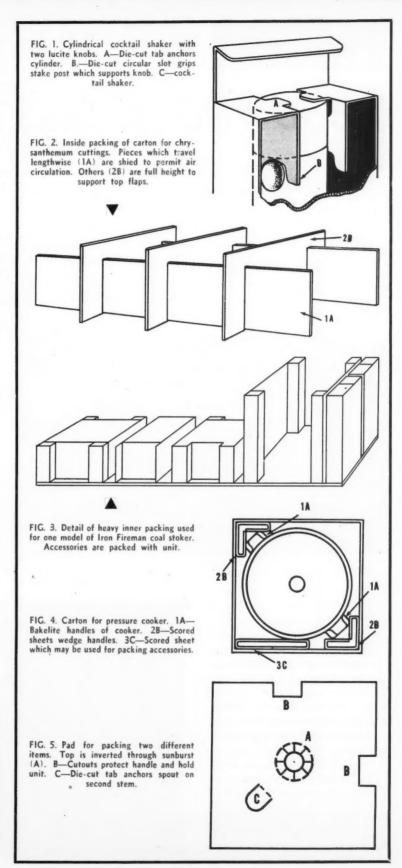
### For Product Weighing 300 Pounds

Figure 3 shows the detail of the heavy inner packing used for one model of the Iron Fireman domestic coal flow stoker, which weighs slightly more than 300 pounds. This container, which received much notice some months

(Turn to page 83)

Exterior view of container for Iron Fireman coal stoker.





# 350-100 lb. bags per hour

Good layout, planning and motion economy enable each fill machine operator to produce more than 350 100-pound bags every 60 minutes.

THE fertilizer business is one of the fastest growing industries in the United States. Rapid strides have been made since the turn of century when the use of commercial fertilizer was negligible as com-

Alabama, prepares its various grades of fertilizer for market.

### Preparation for Filling

Packaging operations at Royster's begin with the discharge of the mixed fertilizer from huge hoppers into dump cars. These cars are moved by a gasoline-powered industrial locomotive over narrow gage tracks located 25 feet above the floor.

The trackage system consists of four parallel sets of rails, approximately 40 feet apart, extending over rows of segregated storage bins. Delivery of the material at the 25-foot level facilitates its unloading and permits storage to heights of at least 20 feet. A large number of bins, each holding from 1200 to 1500 tons, is necessary for the proper aging of the product before being bagged and shipped for use. Adequate storage facilities must also be provided so that an even flow of "cured" goods can be maintained out of the plant during and at the peak of the shipping



12 CUBIC FEET of fertilizer delivered to floor hopper of bucket elevator.

pared to this year's production, which, according to the U. S. Department of Commerce, will top 17 million tons.

Scores of fertilizer factories have been established throughout the country in an effort to meet the demands of farmers for sufficient fertilizer. Its manufacture involves many operations—mixing, crushing, screening, blending, etc.—most of it being performed by automatic machinery. "Packaging" the product varies—depending on the methods of distribution, use and competition. Here is how the F. S. Royster Guano Company, Bessemer,



BAG CLOSING. Operators adjust edges, sew, attach tags at this station.

# STEEL STRAPPING SAVES

\$11,000 and 93 tons

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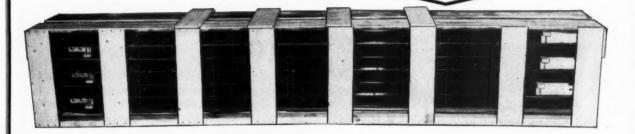
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OLD METHOD

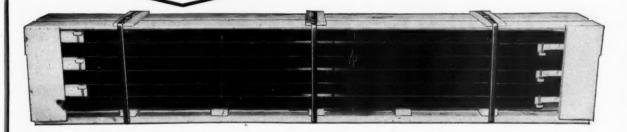
80 bd. ft. lumber, 1450 lbs. 80 min. labor, 6576 cu. ft.



### **NEW METHOD**

55 bd. ft. lumber, 1414 lbs. 50 min. labor, 5232 cu. ft.

### SAVINGS PER CRATE



Here's a typical case of the cost-savings you can make by switching to the Stanley Steel Strapping System. A manufacturer of electric products ships ducts in wooden crates. You can see the whole story in the two crates above...old and new.

Three steel straps do the job of 25 bd. ft. of lumber. The total saving in man-hours and materials amounts to 35¢ per duct which, at the rate of 100 ducts a day, gives an annual saving of close to \$11,000...plus freight savings on the lighter, less bulky crates of 93 tons a year.

No matter what you ship or how you ship...case, crate, carton or bale...the Stanley Steel Strapping System gives your shipments maximum protection at a minimum of shipping room and shipping route cost. The System includes tools such as the new improved Ace Strapping Tool, reels and accessories for every application.

Write today for full information. Demonstration on request. The Stanley Works, Steel Strapping Division, 203 Lake Street, New Britain, Connecticut.

STANLEY

HARDWARE . HAND TOOLS . ELECTRIC TOOLS

Reg. U.S. Par. O

STEEL STRAPPING AND CAR BANDING SYSTEMS

### PACKAGING MECHANICS SECTION

season, and to take care of year-round production.

After the fertilizer has been aged and cured and is ready for packaging, it is then removed from the bins by pneumatic-tired scoop trucks. These trucks are equipped with a hydraulically operated scoop which can be operated as a shovel, carrier and dumper. These scoops

are 48 inches wide and have a rated capacity of 12 cubic feet. However, the operators take on bigger loads by maneuvering the scoops in order to achieve greater cleavage. This practice reduces the number of trips necessary to service each of the four packing units with between 35 and 40 tons per hour. The run between the loading and discharge points varies from 50 to 150 feet as the stock pile recedes in the bin during operations. Turn around time is saved by the ability of the

trucks to travel in either direction at maximum speed.

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Newly made fertilizer packs and lumps during storage, and requires crushing and screening prior to packaging. First, the truck operator dumps his load into the hopper in the floor by tilting his scoop to a 90 degree angle. The material is then raised by a bucket elevator to the top of crusher for granulation. Following this operation the fertilizer falls on a screen after passing through the rolls. The large or rejected material is automatically returned to the rolls for further granulation.

### High Filling Production

Below the screen is a hopper divided into two sections, to each of which is attached a spout and discharge valve. Two bag filling operators stand between the valves and tables on which have been placed supplies of cotton, burlap or paper bags. In this position each operator can (1) take an empty bag; (2) clamp it to the holding fixture of the discharge spout; (3) pull the lever and open the filling valve; (4) watch the eye-level fantype indicator of the bag-filling scale for accurate weighing; (5) close the valve when the desired



BAG FILLING. Numbers show (1) hopper valve (2) bag clamp (3) scale dial (4) conveyor.

weight is reached; and (6) release the filled bag from the holding clamps, permitting it to drop in an



The remarkable MINIMUM MARGIN GRIP is many times referred to as the "Scotchman" because it is so thrifty in the use of stencil board. This feature is made possible by Ideal's Automatic Carriage Action which besides saving time in stencil cutting, results in quite a tremendous annual paper saving. The Ideal pays for saving in this and in many other ways.

Here's the MINIMUM MARGIN GRIP that itself in this and in many other ways. uses only ½" margin.

### and 9 other ways better:

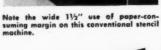
- Easy -To Follow Pointer Large red-tipped letter indicator.
- dicater.

  Automatic Carriage Action

  —A flip of a thumb lever
  for automatic carriage return shift and line spacing.

  Reading-Angle Dial—At a
  45° angle to avoid eye
  strain and errors.
- Visible Cutting—No blind guesswork—reduces errors and stencil waste.
- and stencil waste.

   Large Diameter Hand
  Wheel Spins and stops
- Automatic Word Spacer— Handle trigger does it autematically.
- Short Stroke, Easy Grip Handle — For speed and easy-of-operation.
- Self-Aligning Regardless of cutting speed, lines are always straight and parallel.
- Safety Hood—Protects operators hands and encloses machine from dampness
  and dust.



COHAE.



upright position on a belt conveyor. This operation not only eliminates unnecessary motions by the operator, but has made it possible for him to fill from 350 to 400 bags of 100-pound capacity every hour. It might be well to mention here that the scales, connected to the bag holding device, are counter-balanced to 75 pounds at which point the indicator is activated.

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The floor conveyor moves the bags toward the sewing machine where the tops are closed. (On the filling side of the machine, an operator arranges the top edges of the bag for entry into the sewing unit. This is necessary as the one machine must keep up with the 700to 800-bag output of the two filling operators.) The base of the sewing machine has been set below floor level so that the head is 30 inches above the floor—the approximate height of a 100-pound bag. With the bags moving along the floor, the sewer merely guides the edges under the needle, operating the machine with his foot. He is

not required to lift the bag at any time. Single thread sewing is used to facilitate opening of the bags by the user.

Some states have regulations which require all containers to carry tags showing composition of contents and payment of taxes. When fertilizer destined for one of these states is bagged, an additional operator must be stationed at the sewing machine. He places the tag against one edge of the bag as it passes under the needle. In this way, the same thread closes the container and attaches the tag.

### Four Major Advantages

After being closed the bags are carried from the sewing machine to a push-bar type booster conveyor. This unit elevates the bags to a convenient handling height for loading on two-wheel hand trucks and transfer to box cars. Six bags constitute a load for one hand truck. The railroad siding is adjacent to the packaging line, and box cars are spotted for the short-

### PACKAGING MECHANICS SECTION

est possible travel by the operators. Since four packaging lines are spaced 150 feet apart, the average run for these operators is 50 feet.

This installation at Royster's provides the company with an hourly bagging capacity of more than 140 tons. The advantages of the Royster installation include: (1) Eliminates the handling of heavy bags throughout the filling operation. (2) Location of packaging lines keeps the traffic of supply vehicles from storage down to a minimum. (A point that can also be cited in favor of the car loading operations.) (3) Installation of the scale indicator at operator's eve level aids accuracy in weighing and decreases material losses. (4) Adequate packaging capacity balances production and storage facilities, eliminating bottlenecks in other departments of the plant.



A-B-C Case Unloader and Unscrambler speeds production . . cuts costs for packers whose containers are received packed in re-shippable cases. This new machine automatically empties the case, unscrambles the empty glass containers and delivers them to the conveyor in single file, ready for filling. The empty case can automatically be carried to the filling line for repacking. Get new folder containing complete details. Write A-B-C Packaging Machine Corp., Dept. P6, Moberly, Mo.

- HANDLES GLASS CONTAINERS OF ALL SIZES
- AUTOMATIC AND FULLY ADJUSTABLE
- · REDUCES BREAKAGE
- TESTED THREE YEARS UNDER NORM-AL PACKING CONDITIONS

PACKAGING MACHINE CORP.

OTHER A-8-C PRODUCTS
Automatic Top and Bottom Case Sealer
Automatic Side Case Séaler
Sealer
Mand Glaor,

### One Million CIGARS A DAY

The practice of making cigars by hand gave way during the past few decades to high-production cigar-making machinery. Leading manufacturers are now introducing modern flow and packaging equipment as a final step in achieving plant-wide efficiency. Havatampa is a good example of this trend.

### By D. H. WOODBERY

President, Havatampa Cigar Co., Tampa, Fla.

THE Havatampa Cigar Co. produces in excess of one million cigars each day, and we have been pursuing a course toward the efficiencies inherent in continuous flow and work simplification. The time and effort required by the oldtime manual operations would not have permitted our present high productivity, which is being obtained by use of modern handling and packaging machines. This description traces the material flow in the manufacture of Hav-A-Tampa cigars from the raw leaf to the packaged product.

### Raw Material Moves on Portable Elevators, Belt Conveyors, Dollies

A cigar consists of the filler (core) and binder and wrapper, the latter two being the two outer covers. This raw material is received in wooden cases and bales weighing from 150 to 300 pounds each. The material is purchased from processors who age and season it for periods up to three years, and is ready for use when received from outlying warehouses. Only the filler undergoes additional blending and curing at our plant. Bales of filler are usually stacked in the warehouse by portable elevators.

The material is delivered by floor truck to the blending room, where it is removed by a 500-pound-capacity electric hoist. This equipment also assists in removing and stock-piling the fabric bale coverings. Bales of the various filler materials are dumped by the hoist one upon the other in the desired

proportions to obtain the correct blending, on which the distinctive flavor of a cigar depends.

A belt conveyor then carries the material to the threshers for additional mixing. Another belt conveys the mixture to curing bins (holding 20,000 pounds each). Wooden stock boxes, spotted on 4wheel dollies are employed to transfer the material to the infra-red conditioners, where a belt carries it beneath a bank of these lamps. Inspection is made at the discharge end of this conveyor, and the filler receives a final treatment as it is discharged over the head end of the belt. Chutes feed the processed material to the cigar manufacturing floor below.

### Flow Through Packaging

Here, automatic machinery combines the filler with the binder and wrapper to make the cigar. All production is controlled in lots of 50, which is the normal amount packed per box. After manufacture, the cigars are conditioned for a few days before they are sorted for color, which is done in packing press boxes. These boxes are threesided (see photos) and have 20 shelves or dividers, each holding 25 cigars, or a total of 500 for each unit. A compression lid is applied which gives the cigars their shape as well as "pressure."

Twenty-four hours later the cigars are on their way to the packaging department. Since manufacturing is on the second floor of one building and packaging on the first floor of an adjacent one, a reversible flight conveyor was provided. The loaded stock or packing press boxes are lowered gently by the descending flights; when the

PACKAGING MECHANICS SECTION

drive is reversed, the same flights return the empties to the manufacturing department. One of the photos shows how the boxes, arriving on a section of gravity wheel conveyor, are loaded on a skid for delivery to the wrapping and banding machines. The relatively light loads are easily handled by the single-stroke hand lift truck included in this view.

At the cellophane wrapping and banding machine, the operator removes the trays from the press boxes, then slides each layer of 25 cigars into the magazine of the machine. The individual cigars are fed into a four-position rotating fixture automatically, where the band and then the cellophane wrapper are applied.

The bands are fed singly from a holding device; the cellophane is provided in rolls from which the proper lengths are stripped and cut. The four-position rotating device does the operations in this sequence: picks up one band, inserts the cigar in the slot beneath the band, cuts off and places the required length of cellophane over the cigar, and raises the latter through a folding guide and heat seal unit. Upon completion of wrapping and sealing, the cigar is ejected.

Up to this point, the flow of material through the machine was from left to right; it is now reversed in order to return the cigar to the operator's table. One of the photos shows that the work table adjoining the machine has two levels. This arrangement allows the operator to place the empty boxes on the lower level and rake the cigars into it by the layer from the upper level. A special rake is used for



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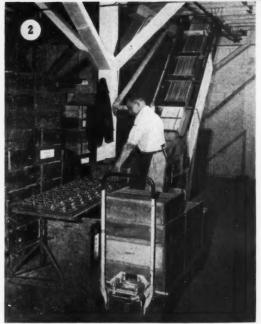
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- | BELT CONVEYOR moves tobacco for conditioning, inspection. Dolly moves stock boxes.
- 2 FLIGHT CONVEYOR delivers full press boxes; is reversed to return empties to the upper floor.
- 3 AUTOMATIC CIGAR WRAPPER applies band and cellophane jacket. Note the two-level work table.
- $4\,$  POSITION OF full boxes in revenue stamp machine is changed  $90^\circ$  to seal stamps on two sides.
- 5 FLOOR CONVEYOR brings cases to sealing, stenciling. Note tape dispenser, stenciling machine.





Rapid-Wheel conveyor can move your raw materials, parts or prod-



ucts for 30 to 70% less.

The illustration shows incoming stock on its way to storage. And not a man in sight! The conveyor is loaded right at the truck or car ... unloaded at the stacking point.

You can get Rapid-Wheel conveyor in either steel or aluminum . . . straight sections and curves in several lengths, widths and wheel ararrangements, plus spur curves, switches and other accessories.

Write direct for the latest gravity conveyor catalog or call your local Rapids-Standard representatives.

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### THE RAPIDS-STANDARD CO., INC.

377 Rapistan Bldg., Grand Rapids 2, Mich. Representatives in principal cities

\*T. M.

RAPISTANI
MATERIAL HANDLING EQUIPMENT

### PACKAGING MECHANICS SECTION

the purpose.

After a prescribed period in a press, each box is inspected and stamped to designate the color of the cigars, which is followed by nailing the lid shut. The boxes are then run through a revenue stamp machine. The government stamp must be affixed to the lid (top) and side of each box. Here is how this is done. The boxes are fed into the machine flat, as shown in one of the photos. They pass under the stamp applicator and the stamp is attached to the top. To complete the seal on the side of the box, the latter is upended on one side and thus passes through the compression unit, which fastens the overlapping part of the stamp to the side of the cigar box.

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An operator shunts the full cases on a section of floor-mounted roller conveyor to the sealing and marking table. The gummed tape dispenser is worthy of special note. It has two separate ejector levers, and each one can be set to discharge a strip of different length, making it unnecessary to make adjustments from "short" to "long." This dispenser also has an electrically heated water well, which maintains the temperature best suited for effective scaling.

I have attempted to describe the simplified production techniques along with the continuous flow method in use at the Havatampa Cigar Co. It will have been noted that optimum use of high-speed manufacturing and packaging machinery is obtained by use of such handling equipment as portable elevators; conveyor belts, an electric hoist, castered equipment, as well as gravity wheel and roller conveyors and a specific type of gummed paper dispenser, the latter for use in conjunction with our rectangular boxes. The adoption of these devices, engineered into a flow system, has enabled us to increase our production to meet the unprecedented demand of the past few years.

# IDEA conveyor

A new department devoted to improved handling methods. Send us your ideas which have been adapted to actual operations. Five Dollars will be paid for each one accepted. Include a sketch or photo.

### Use Power Equipment Economically by Irving Footlick

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In MANY operations, empty load carriers must be shifted about in short intra-departmental moves. Often powered equipment is inefficiently applied in handling fairly light units for lack of a simple device that could do the job more economically.

The type of angle iron rack shown here is five feet long and is



HAND TRUCK has prongs for easy handling

used by EKCO Products Co., Chicago, for delivering wire coils to production from the warehouse. Fork trucks do not have to transport it nor is it necessary for two men to carry it. One operator does the job effortlessly by use of the two-wheel hand truck shown. This truck has been equipped with two 24-inch prongs, which are slipped under the rack. The unit is thus moved to the desired location for temporary storage or loading.

### **Don't Keep Production Waiting**

Two useful ideas are illustrated in Figure 2. To give mobility to completed pallet loads of finished goods at the end of production lines, the company has equipped standard two-face pallets with swivel casters, as shown. This simple and clever method eliminates waiting time at the end of the lines

—waiting for a fork truck operator to remove the full pallet and place an empty one in position. The operators push the loaded castermounted pallet out of the way and roll the next one in position to receive the goods. Incidentally, the outside boards of the bottom deck are of oak for added life. When necessary, the fork truck can also pick up the "live" pallet.

The live pallet method has eliminated the need for the constant presence of a fork truck to move out of the way material coming off one line. Now one fork truck is serving several lines in adjoining departments.

The second idea is illustrated in the use of the sheet of paper. The shipping containers shown are one cubic foot in size, which does not permit their being stacked in interlocking pattern.



CASTERED PALLET. Sheet of paper binds

The sheet of paper does the trick. Placed over the fourth layer, it binds the containers below as well as the two layers placed on top.





### THE RUGGED, FLEXIBLE MODERN STORAGE METHOD

For storage of bar steel, plates, palletized material, etc. ECONO-RACK has a wide range of uses. Saves space, provides easy access to stock, simplifies inventory. In-

Descriptive bulletin ER-102 sent on request or ask for quotation based on your specific requirement.

ABELL-HOWE CO.



For additional information on these products, write Dept. 5, Flow Magazine, 1240 Ontario St., Cleveland 13, or use postcard bound into this issue.

### PERFORATED BOX

NP1-A new perforated steel box for washing and degreasing operations has been introduced by the Rack Engineering Co. This unit is constructed of heavy duty steel, with perforated



bottom and sides. Manufactured in six standard sizes, it is designed for washing and degreasing of parts and products in a variety of sizes and shapes.

### AUTOMOTIVE FILLING MACHINE

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NP2-Triangle Package Machine Co. has modified its Elec-Tri-Pac to be used for automatic filling of containers with small metal specialties, such as fittings, stampings, nuts, bolts, screws, etc. Material is automatically conveyed into the machine's supply hopper by an inclined, cleated conveyor belt, which takes it to vibratory trays. The machine weighs out a predetermined amount and de-



posits it into the container. It is further stated that only one operator is needed to handle this model. Pictured with the Elec-Tri-Pac is a portable conveyor, also made by the Triangle Co., which may be used in conjunction with the machine.

### **POWER CONVEYOR**

NP3-A 20-foot power conveyor has been developed by Essex Conveyor Mfg. Co., Inc. It is designed to handle any type of carton, crate, sack or box, horizontally or up inclines to 60 degrees. It can be raised one foot horizontally from



3'6" to 4'6" in addition to angle inclines. The belt is 16 inches wide, has a speed of 50 feet per minute,



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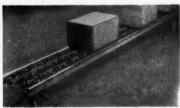
and maximum single load of 250 pounds. The belt direction is reversible.

### ROTATING DRUM TRUCK

NP4-The Rotator, a portable rotating drum truck, has been developed by The Morse Manufacturing Co. It is designed to



put your production on wheels . . . in factory, warehouse, shipping room.



You can cut handling costs and save manpower with Speedways gravity wheel conveyors.

If the products you make require frequent handling between fabrication and shipping, nanding between radication and snipping, you can use Speedways. For these versatile, portable, \*maintenance-free conveyors are adaptable to nearly every size and type of flat-bottomed package or container weighing up to 100 lbs. per squre foot of surface. Switches, curves, powered lifts, and other accessories give you complete freedom in planning. Seedways compare lifes. planning Speedways conveyor lines.

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HAND TRUCKS

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American Hand Truck Bulletin - 50 styles and sizes.

# REVOLVATOR GO-GETTER POWER LIFTRUCK

Cut Your Material Handling Costs with this powerful "walk-along" truck

Automatic hydraulic braking, fingertip directional control at end of handle, large dual driving wheels, delayed action control, adjustable Timken bearings.

Only 271/2" between control handle and back of battery.



Skid Model

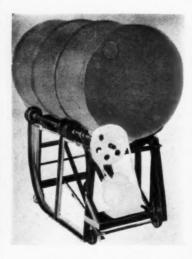
Skid piatform lifts 4" with 3½" under clearance. Heights 6" - " 9". 11"; lengths 36", 48", 54", 60", 72", and over. Power unit quickly removable from body. A 6 cell 13 plate battery will give normal 8 hour operation without recharging. Also pailet and high lift models.

Other REVOLVATOR Products include: Revolvator Portable Elevators, Red Giant Hand Liftrucks, Hydraulic and Traction Elevators, Barrel Dumpers and Positioners, Sectional Storage Racks.

### REVOLVATOR CO.

8739 Tonnele Ave. North Bergen, N. J. Since 1904

accommodate drums up to 55 gal., and will rotate a maximum drum



load of 500 lbs. at a speed up to 50 rpm. It is especially recommended for mixing paint, oils and thinners; making adhesives and plastic compounds; tumbling and cleaning small parts; cleaning inside of used drums, etc. A drum can be drained while mounted.

# SPEED UP MACHINE FEED IN G WITH THE GLOBE SAVE Production LIFT STRETCHING STOOPING

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Cut your machine feeding costs... raise materials UP to machine level with a Globe Production Lift. It saves all that costly time-lag of workmen stooping, stretching, or reaching. Boosts production as much as 1/3. Foot pedal control keeps material level for fast, profitable feeding. Simple, fool-proof, installs anywhere.

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### CONCO TORPEDO ELECTRIC HOISTS

- ¥ 250-, 500- and 1000-lb.
- ¥ Hook, Bolt or Trolley Suspension.
- ¥ Positive Electric Brake. Enclosed Limit Switch.
- ¥ Safe, One-Hand Operation. Push Button Controlled, for

### TODAY'S TOP VALUE IN HOISTS



ALUE IN HOISTS balance load, eliminate overlapping cable. Simple, rugged 
construction employs only two 
gear reductions — one worm 
gear and one spur gear. Worm 
is of high quality steel forging, 
hardened and ground, operates 
on Timken radial thrust bearings. Best grade chilled phosphor bronze used for worm 
gear. Spur gears machined 
from forged steel blanks with 
full depth teeth. All gear 
shafts operate on ball bearings, 
fully enclosed, in a bath of oil.

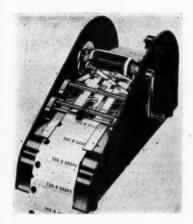
The CONCO TORPEDO ELECTRIC HOIST is fast, compact, powerful, easy-to-operate. Double drum construction centers and balances load, assuring an even lift, freedom from sway, greater safety and efficiency for the operator. Write today for detailed specifications and prices. Prompt delivery.

CONCO 38 GROVE ST. ENGINEERING

WORKS MENDOTA, ILLINOIS

### ADDRESSING MACHINE

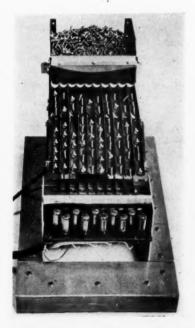
NP5—The Weber Addressing Machine Co. is manufacturing a tag and label addressing machine, the Model R Tag-O-Graph. It



is designed to address or mark tags, or labels on a multiple basis. Stencils may be cut by hand by use of a stylus, or on a typewriter. The machine will print up to nine lines on each stencil at a speed of 150 tags or labels per minute.

### COUNTING SYSTEM

**NP6**—The Potter Instrument Co. has developed a high speed count-



ing system utilizing a number of parallel feed channels and parallel detectors which are capable of resolving and totalizing simultaneous counts. The new equipment is known as the Multiple Channel Counter. The counting circuits can be arranged to provide a predetermined count for packaging or a totalized count for inventory checking. The counter circuits are completely electronic and contain no moving parts. They will operate on a 20 per cent change of light.

### ANCHOR THREADER

NP7—The Acme Steel Co. is putting on the market a new Anchor Threader



(Model E2AO). With two strokes of the handle, this tool is said to thread either 34" or 11/4" unit-load band about an anchor. The tool, which weighs





seven pounds, can be mounted on a bench or portable plank with three lag screws and washers which are furnished. The new model is said to reduce anchor threading time and make the job easy.

#### DIVERSIFIED HAND TRUCK

NP8—A new model of its Platform Worksaver has been designed by the Yale and Towne Mfg. Co. According to the company, the battery-powered model has a full 13-inch lift, facilitating

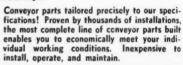


the handling of skids ranging from 6 to 18 inches in height. It is designed to answer the need of the manufacturer who receives from and ships to customers and suppliers, each of whom has a different type of skid, skid-rack, or skid-bin. The truck has a capacity of 6000 pounds, and is said to combine the features of short turning radius, light weight, small size, and ease of maneuverability.



**SPECIFICATIONS** 

- Brackets: Pressed steel and drop forged. Single or dual wheel applications.
- Wheels: Flanged, flangeless; open or grease-sealed type.
- Attachments: Pressed steel or drop forged; idler, pendant, clevis types, fit any of above wheel and bracket assemblies for adaptation to No. 348, 458 or 678 chains.
- Roller turns: from 18" to 48" radius, 15° to 180° central angles.



Write today for catalog of prices, specifications.

SAGINAW PRODUCTS CORP.



Loads are heavy at the Luken-weld Division of the Lukens Steel Co., Coatesville, Pa. This paper mill machine cylinder weighs 4700 lbs., but it is just a leisurely lift for this Lorain TL-20 Self-Propelled Crane.

Using interchangeable hook block and electric magnet, this single-engine, rubber-tire mounted TL-20 brings economical "cranepower" to plant operations. It is one-man operated, travels at speeds up to 7 M.P.H.; may be equipped with 15 different crane attachments.

Why not give your material handling operations that new "lift" through "cranepower". For information on Lorain crawler and rubber-tire mounted cranes, call or write your local Thew-Lorain distributor.

THE THEW SHOVEL COMPANY

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LORAIN CRANE VS MAN HANDLING HANDLING SAVES MONEY



ROLLAWAY SKIDS



AND 2-WHEEL **JACKS** 

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8" WHEELS STEEL, RUBBER OR FLOR-SAVR ROLLER BEARING

2500 LB. CAP. & UP HEAT TREATED AXLES AND CONNECTING PINS. BOLTED & WELDED DESIGN. MERELY REMOVE BOLTS TO REPLACE DECK BOARDS.

LOUISVILLE 10, KENTUCKY

- Double **Ball Race**
- Molded-On **Rubber Tires**



High pressure lubricating fittings. Grease retaining chambers, large diameter balls in upper outer races take load as well as side thrust. Races protected from dust and water by overlapping lips on plate or hangers. Molded-on, easy rolling, heavy duty rubber tires to protect floors. We serve resale dealers and original equipment manufacturers.

#### SPECIFICATIONS

Caster No.	Wheel Size	Bolt Hole Centers	Height	Capacity
14-GSR	4 x 2	3 x 4	5%	180 lbs.
54-GSR	5 x 2	3 x 4	634	250
64-GSV	6 x 2	41/8 x 51/2	8	310
55-GSV	6 x 21/4	41/8 x 51/2	83%	360
85-GSV	8 x 2	5 x 61/2	101/2	390
34-GSV	8 x 21/2	5 x 61/2	101/2	530

Buffalo CASTER

182-6 Breckenridge St., Buffalo, N. Y.





Available in 8, 10, 12 and 14" belt widths. Equipped with 1/3 H.P., 60 cycle, 110 volt single phase motor; floor locks and four swivel casters. Frame is 10' long. Special lengths built to order. Degree of incline controlled by positive handwheel.

Write for details on this item and our full line of Materials Handling Equipment.

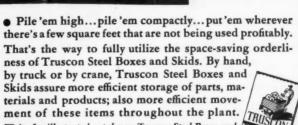
**EQUIPMENT COMPANY** 

30 ESSEX STREET . BUFFALO 13, N. Y. (District Engineers in All Principal Cities)

### STORAGE EFFICIENCY

increased by the versatility of TRUSCON STEEL

> and SKIDS



Write for illustrated catalog on Truscon Steel Boxes and Skids to belp get jobs done better and faster in your plant.

6202 TRUSCON AVENUE

C'LEVELAND 4, OHIO

SUBSIDIARY OF REPUBLIC STEEL CORPORATION

### PORTABLE CONVEYOR

NP9—A new inclined portable belt conveyor has been announced by the Sage Equipment Co. The unit is 15'



in length, 24" wide, with a 3-ply solidwoven cotton duck belt. The belt is reversible. Each end can be raised and lowered by positive hand wheel, and the unit is equipped with floor locks.

In addition, International Har-

vester powered Shop Mulifts

have the same engines as the

famous Shop Mule, used in 73 industrial fields. Parts and service are quick and world-wide.

Be sure to send for specifica-

tions and operating data showing

how the new Shop Mulift can

help solve your problems. Just tear out this ad and mail with your letterhead and name. Several units can be coupled together to make a continuous moving surface.

### SKID WITH RACKS

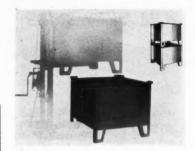
NP10 — The Palmer-Shile Co. is introducing a new type all-steel skid with



end racks, designed for handling heavy loads with ease and safety. It is constructed of heavy gauge corrugated steel with angle iron legs that provide ample clearance for fork lift or hand operated trucks.

### STORAGE BIN

NP11—A new type of storage bin which provides a practical method of storing small 'parts in limited floor



space is offered by the Palmer-Shile Co. Designed with a four-way entrance for use with a hand, power or fork truck, it can be tiered with a portable elevator or fork truck. It can be also built with crane lugs. It is constructed of heavy steel plate with legs and corner reinforcements of angle iron.

### THREE-IN-ONE TRUCK

NP12—A new three-in-one truck, #1200, is now being marketed by The Holms-Menne Material Hldg. Equip., Milwaukee. A conventional two-wheel



hand truck, it may be converted to a tri-wheel carrier by mounting of the front wheel attachment, as shown. Further change is afforded by fixing the wood platform to the body. Completely assembled, the truck has a maximum load carry up to 1200 lbs. Designed for narrow aisles, this model



is constructed of cold rolled steel and tubing, with solid rubber, ball-bearing wheels, with a weight of only 60 lbs. Platform is full length iron framed.



have both-

FREE LIFT of 55" with an overall height of only 83",



and



UNOBSTRUCT-ED VISION when travelling with load.



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### SMALL but RUGGED

Model "D" Productimeters are compact in design and built to give you service. They assure accurate count on every job run. The "D" line includes Stroke, Lineal, Hand-operated, Electric and Rotary models . . . a wide range to serve a wide variety of applications in your plant!

Send for Catalog No. 100

### DURANT MFG. COMPANY

1944 N. Buffum Street
Milwaukee 1, Wisconsin
Representatives in Principal Cities

Manufacturers of

### PRODUCTIMETERS

THE SPEEDOMETERS OF INDUSTRY



# 7he "LITTLE HUSTLER" TRANSFERS STAMPINGS AS FAST AS PRODUCEDI

The "Little Hustler" is fully portable and quickly adjustable to a wide range of applications. The \$ foot size shown above has a maximum delivery height of \$1 inches at 45° and \$50 inches in a horizontal position. Made in 13 models: 4-5-8-10 and 12 ft. long, by 12", 18" or 24" wide. Also special sizes. Send for circular LHC. We design and manufacture permanent conveyor systems and all types of SPECIAL EQUIPMENT.

### MAY-TRAN ENGINEERING, INC.

Development Engineering and Manufacturing 1710 Clarkstone Rd. Cleveland 12, Ohio

## HALL()WELL

## of STEEL





Fig. 760 1-Bar Handle

Fig. 753 l-Wooden-Stakes



Fig. 757

## ...BUILT TO TAKE GRUELLING PUNISHMENT FOR YEARS

... and with minimum maintenance and repair. This sturdy, welded, splinter-proof construction insures against weak, loose joints, wobbly trucks and rapid wear ... casters with free-rolling wheels make the "Hallowell" run easily, even under heavy loads. Types and styles—each a model of smooth-running durability—are available for every service. Write for your copy of the "Hallowell" Catalog, it describes them all.



Fig. 762 2-Pipe Stakes





1 Rac

Fig. 751 4-Pipe Stakes

OVER 45 YEARS IN BUSINESS

### STANDARD PRESSED STEEL CO.

JENKINTOWN, PENNA., BOX 799

Boston • Chicago • Detroit • Indianapolis St. Louis • San Francisco

# SPILLED LOADS WASTE TIME AND MATERIALS

### Replace Worn-out Floors with 'Incor' Concrete — No Plant Tie-up

Over a week-end you can replace worn floor topping with 'Incor' concrete—NO PLANT TIE-UP. 'Incor'\* 24-Hour Cement cures thoroughly in 24 hours, saves you a week or more. Andfaster THOROUGH curing assures stronger, longer-lasting floors.

New book, "Concrete Floors", gives details — write TODAY for copy. Address Lone Star Cement Corporation, Room 2200, 342 Madison Ave., New York 17, N. Y. \*Reg. U.S. Pat. Off.



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Offices: Albany • Bethlehem, Pa. • Birmingham • Boston • Chicaga • Dallas Hauston • Indianapolis • Jackson, Miss. • Kansas City, Mo, • New Orleans New York • Norfolk • Philadelphia • St. Lovis • Washington, D. C.

### HOMAS TRUCK of Keokuk PRY TRUCKS

Easy, Fast, Safe For Big Loads

For Big Loads

Loads of freight too big or too heavy for regular 2-wheel trucks can be handled easily with Thomas Pry Trucks, particularly when used in pairs. Sharp steel nose slides under load, tremendous leverage enables user to easily raise load as high as 9' from floor. I rucks, docks and in mfg. plants. One of many Thomas 2 and 4 wheel trucks. Write for bulletin P.T.

THOMAS TRUCK & CASTER CO.

4864 Mississippi River, Keokuk, Ia

### THOMAS One Man TRUCK

No Rocking-No Lifting

Easy for one man to handle un to 1000 lb. barrels, drums, quickly, safely. Simply engage sliding book in rim of barrel. puil handles slightly-hold with foot. That's all! Loads, unloads automatically. Trucker never touches barrel. Load balanced perfectly. No arm strain. Welded steel, rubber tires. Hvatt bearings. Low priced. Try one. Return collect if nit "best yet."



3171 Mississippi River, Keokuk, Ia







The publications featured on these pages were written by experts. They are FREE publications. To obtain these use the postcard bound into this issue,

25-Tractors and Fork Truck . . . From W. F. Hebard & Co. Three bulletins concerning its dump and hauling tractors, and fork lift truck. "On the job" photos and fork lift truck. of the various models are included, together with detailed descriptions, operating data, and specifications. Models are designed for handling scrap and bulky materials, heavy pushing or pulling jobs, and fork truck operations requiring a capacity of 5000 lbs.

26—Casters . . . A catalog page by The Bassick Co. describes an all-forged steel caster. A breakdown of each caster section is shown together with the completed unit. Advantages of various parts are outlined.

27—Locomotives . . . For those interested in industrial diesel electric and mechanical locomotives, The Whitcomb

Locomotive Co. offers an illustrated brochure. Electric models ranging from 25 to 80 tons, and mechanical models from three to 25 tons are pictured and described. Also included are available accessories. Operating features are stressed.

28—Pneumatic Conveying Systems
.. Bulletin No. 101 is offered by Convair Corp. These pneumatic systems are designed for the chemical, food, glass, steel Corp. and allied industries. Diagrams of various installations describe layout principles and operating methods.

-Hydraulic Handling Equipment ... LYON-Raymond hydraulically operated material handling equipment is illustrated in Bulletin 202. Included are models of various lift trucks, portable elevating tables, and sheet and strip feeding tables. Each model is described in detail.

30-Wooden Pallets . . . A special form is available from Grasty Pallet Co., designed for manufacturers to list their own specifications for pallets according to their various needs. These pallets are of hardwood construction, with 6 x 2½" cement coated drive screws, and chamfered end boards. To prevent splits, holes are drilled through deck boards to receive all

31—Handling Equipment . . . Its line of material handling equipment is featured in a catalog from Barrett-Cravens Co. Among the models included are various types of manual and powered trucks, dollies, skids, portable elevators, stacking frames, storage racks, and portable cranes. Each item is pictured together with specifications

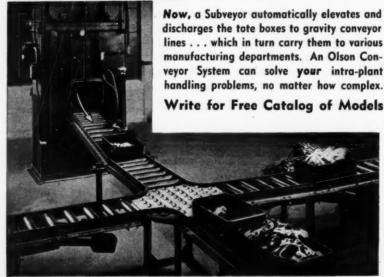
32—Power Units . . . Industrial power units are pictured and described in a booklet from the Salsbury Corp. Included are automatic clutches and transmissions, trucks, and pneumatic tools. Action photos of production, testing, and applications are shown.

33-Magnetic Separator . . . A non-electric separator designed to remove iron from moving products is the topic of a circular available from the Dings Magnetic Separator Co. Hinged to wood or metal chutes, or installed above a belt conveyor, it separates the ferrous products from the main flow of the traveling materials.

34-Conveyor and Loading Equipment . . . The subject of loading and conveyor equipment is treated in a catalog issued by the Atlas Conveyor Co. Listed and illustrated is the complete line of portable belt, flight, and live roller conveyor and gravity systems, and portable and bucket elevators.

This was a back-breaking, time-consuming job...before the

# TA CONVEYOR SYSTEM



SAMUEL OLSON MFG. COMPANY, INC. 2426 Bloomingdale Rd. Chicago 47, III.



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### The clock decides

Time is often the costliest ingredient of the product. A 'Budgit' electric hoist saves so many minutes each working hour that in many installations, it pays for itself quickly—invariably it earns its way to bigger profits.

Not only does it save time, but it enables the worker to get out more work with so much less effort. No longer does he fear rupture or sprains from lifting. He produces as much toward the end of the day because his energy has not been drained by lifting.

There are no installation costs. Hang up, plug in and use! The amount of current consumption is too small to consider.

In production, inspection and assembly lines
—wherever lifting is an important part of
the day's work—savings are certain.

Put the little yellow 'Budgits' to work for you-now.



Made in sizes to lift 250, 500, 1000, 2000 and 4000 lbs. Prices start at \$119. Write for Bulletin No. 371.



MANNING, MAXWELL & MOORE, INC. MUSKEGON, MICHIGAN

Builders of 'Shaw-Box' Cranes, 'Budgit' and 'Load Lifter' Hoists and other lifting specialties. Makers of Ashcrolf Gauges, Hancock Valves. Consolidated Safety and Relief Valves and 'American' industrial instruments.

# LYON-Raymond New SINGLE-STROKE LIFT TRUCK 2500 16. CAPACITY •

- Single frame construction, saving weight without sacrificing strength. Gives over twice the underclearance of any double frame lift trucks.
- Operates in confined spaces; handle can be manipulated at any point within 90° right or left of center.
- Elevating mechanism completely enclosed mechanism protected; injury to workers eliminated.
- Push button action engages lifting device. Positive lock holds load in elevated position.
- Built-in hydraulic release check lowers load gently — safely.
- Safety lock prevents handle from flying back when partially lowered during lifting operation.

LIGHTWEIGHT STURDÝ-SAFE

SIMPLE Easy to Operate



 This notably different Lyon-Raymond lift truck is a worthy addition — on its own particular merits — to a well-established line of Lyon-Raymond hydraulically operated lift and pallet trucks.

LYON-Raymond Corporation
702 Madison St., Greene, N.Y.

Material Handling Equipment—Engineered Hydraulic Devices

# INDUSTRIAL TRUCKING FLOORS Resurfaced to withstand any traffic . . .



\$15.00

per unit

Consists of:

4-50 lb. Bags Powder

5 Gals. Floorcrete Liquid

Coverage:

100 sq. ft. about 1/4" thick

# with CAMP'S No. 7 INDUSTRIAL FLOOR RESURFACER Tougher than Steel—Easy to Apply

COSTS ONLY \$15.00 PER 100 SQUARE FEET

Camp's No. 7 is applied like cement over your present wood or concrete floors. A ¼ inch thickness resurfaces worn or rough concrete floors to withstand any traffic. Sets in three or four hours—ready for heavy trucking in 24 to 48 hours. Camp's No. 7 comes ready to mix—nothing else needed. Your choice of brown, red and natural dark gray.

Order a trial unit—you must agree it is the best resurfacer you have seen, or there will be no charge.

EVERY INSTALLATION UNCONDITIONALLY GUARANTEED

Further information describing this and other Camp's flooring material sent on request.

The CAMP COMPANY
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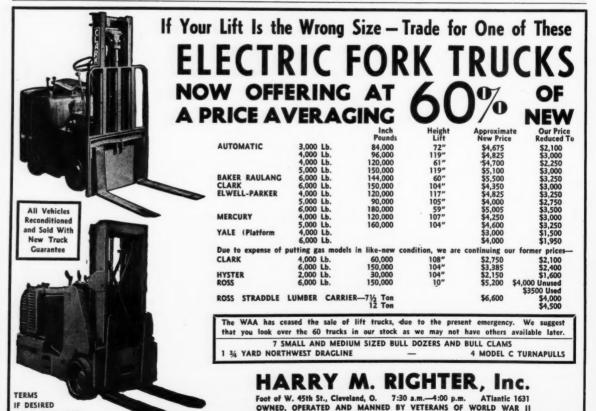
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Rates for "Positions Wanted" \$3.50 classifications \$3.50 minimum for 25 words, each additional word 10e; boldminimum, limit 25 words. For all other face type or all capitals, \$6.00 minimum for 25 words, each additional word 15e; limit 50 words. Box addresses count as five words. All insertions are payable in advance.

These classified columns are not intended for the advertising of new products by manufacturers, their representatives, or their distributors. These columns are limited to Help Wanted or Positions Wanted advertisements, and for the offering of used equipment by the users of such equipment.

### SALESMEN, DISTRIBUTORS

Nationally known manufacturer of Electric Hoist and Cranes is interested in receiving applications from sales engineers selling on a commission basis in the following cities:

Buffalo, N. Y.; Los Angeles, Calif.; Jacksonville, Fla.; Columbia, S. C.;

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DISTRIBUTORS WANTED: Nationally-known manufacturer gravity conveyor, has few choice territories available including Cleveland, Chicago, Omaha, Boston, Los Angeles, Minnesota; our Distributors have been with us many years, are well satisfied with Franchise Agreement. Write fully telling what lines now handled, exact territory covered, whether warehouse facilities available, discount expected, etc. Box 7148.

WANTED MANUFACTURERS'S AGENTS throughout the U. S. who are now selling packaging and filling equipment. We manufacture a competitive line of automatic and semi-automatic liquid bottle fillers. We pay highest commission in this Industry. In replying give territory you cover, lines now handling, number of men in your Organization, and length of time in business. Schaffner Industries, F-1, Emsworth, Pittsburgh 2, Penna.

#### FOR SALE

ROLLER CONVEYORS, Used three months, Condition excellent. 12" to 36" widths; 4" to 12" centers; set high and low. Price \$1.10 to \$1.50 per foot. GREENPORT BASIN AND CONSTRUCTION COMPANY, Greenport, New York. Tel: 88.

THREE USED CRANES FOR SALE 3 Ton capacity, electric, DC 20' lift, excellent condition. Joseph Behr & Sons, Inc. 1116 Seminary St., Rockford, Illinois.

6 - Automatic Model THTFLPFL telescopic fork lift trucks, 600 lb. capacity at 60" load length. 1 - Elwell-Parker Model ELW-10, 10,000 lb. capacity, telescopic fork lift truck, 60" load length. These trucks are in excellent condition, are 2 years old and are equipped with Ready Power Units, and can be purchased reasonably. Box 7248.

### EQUIPMENT FOR SALE

Slat Conveyors

4 ea 48" wide 80' long with drives— \$3126.00 ea

2 ea 24" wide 60' long with drives— \$1352.00 ea

1 ea 30" wide 60' long\_\_\_\_\_\$612.00 1 ea 18" wide 20' long\_\_\_\_\_\$416.00 998 chain new and used—price based on quantity

458 chain new and used—price based on quantity

ALEXANDRIA MACHINERY & EQUIPMENT CO. P. O. BOX 1392 ALEXANDRIA, LOUISIANA

One New Pneumatic Sale Corporation "Combination Filler and Sealer", equipped to automatically fill, and seal one size carton, size 2" x 3½". Capacity 60 per minute. Has never been used. Still on original Factory shipping platforms, Ready for Immediate Shipment. Priced below today's cost. Write Schalk Chemical Co., 3333 W. 48th Place, Chicago 32, Illinois.

### USED EQUIPMENT WANTED

WANTED
USED MATERIAL HANDLING
EQUIPMENT

We buy FORK LIFT TRUCKS

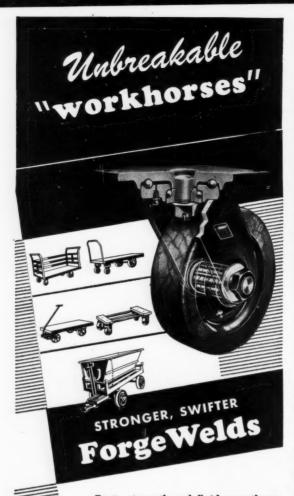
Gasoline or battery driven Gravity Conveyors, Hand Lift Trucks, Pallets, Cranes

A & A MACHINERY CORP. 1267 Flushing Ave., Brooklyn, N. Y.

### AUGUST ISSUE BRIEFS

Planning a pallet program around building limitations . . . efficient yard operations for cinder crushing . . . mechanized handling of giant rolls of paper in a box making plant . . . one man operation in a veneer warehouse. Watch for these articles in early issues of FLOW.





Brute strength and fluid smoothness -you get both in ForgeWelds. Dayin and day-out-under heaviest loads and relentless pounding-these extratough casters keep rolling on. And how they roll! Hauling units equipped with ForgeWelds glide along on the finest ball bearing swivels and roller bearing wheels . . . speed up handling in any plant. What's more, once these "workhorses" are on your trucks, replacements will be rare indeed. ForgeWelds come in all types and sizes for all needs.

### COST-SAVING MATERIALS HANDLING PRODUCTS



### SERVICE CASTER & TRUCK CORP.



Executive Offices: Albion, Michigan Plants at Albion, Michigan and Somerville 43. Mass. Representatives in all Principal Cities



FOR HANDLING A BARREL, DRUM OR SKID

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An efficient method of lifting and dumping barrels is provided by the Economy barrel dumper. A special cradle and tilting winch holds the barrel at any angle for draining.

Cradle and winch can be detached for skid handling, using the platform arms alone. The Economy line of portable lifters range from 500 lbs. to 5000 lbs. capacity and up to 60 ft. lift. Special equipment engineered. Complete catalog on request.

### ECONOMY ENGINEERING CO.

2677 W. Van Buren St., Chicago 12, III.





#### **SAVES TIME**

Only one setting needed permits turning, switching and backing.

#### **CUTS COSTS**

No resetting or shifting required.

### PROVED IN SERVICE

SPEED the movement of heavy, bulky articles. Handle the tough ones with ease. Just slip in a pair of Dolly-Rollers. Full-swinging swivel action permits movement in any direction. Two models available . . . heavy duty steel roller, and rubber-tread type for finished floors. Compact. Simple. Approved by Safety Engineers. Rugged construction assures long life. Dolly-Roller is the NEW way to move heavy objects. Order today . . . faster, safer Dolly-Rollers.

SPECIFICATIONS x 8" x 4" high x 8" cleat plate

### SEE YOUR MATERIALS HANDLING DEALER TODAY

or Write THE DOLLY-ROLLER CO. Dept. 778, 6016 E. 12th St., Kansas City 3, Mo.

# Institute Chapter and Association Activities

HIGHIJIGHTING the May meeting of the Northeastern Ohio Chapter of The Material Handling Society was a talk by David H. Cissna, of the Towmotor Corp. He spoke on the development of the fork lift truck, its application to various problems in industry, and what may be expected of it in the future. The next meeting of the chapter, which meets in Cleveland, is scheduled for September.

RVING M. FOOTLIK, instructor in material handling engineering at Illinois Institute of Technology and a member of the engineering staff of Ekco Products Co., Chicago, has been elected president of the newly organized Midwest Materials Handling Society, Chicago. The society is affiliated with the National Materials Handling Institute. Other officers elected were: vice president, H. E. Lindquist, International Harvester Co., Chicago; treasurer, J. S. Williams, Jewel Tea Co., Barrington, Ill.; and secretary, Raymond Monroe, Modern Materials Handling Magazine, Chicago.

MATERIAL Handling Technical A Section has been organized as part of the Detroit Chapter, American Society of Mechanical Engineers. It was felt that such o section was needed, because of the concentration of automotive manufacturing operation in which material handling is a vital phase of production. It will meet once a month, with prominent speakers featured. Highlighting the first meeting was a talk by Nelson L. Davis of the Nelson L. Davis Co., Chicago, who spoke on "Material handling-Its need and problems in our manufacturing economy."

THE Material Handling Association of Southern California, Los Angeles, elected new officers at its annual May business meeting. They were: president, A. Mazzola, Angelus Engineering Corp.; vice president, Stanley E. Morris, Stanley E. Morris Co.; and secretary-treasurer, William F. Mills, Pacific Factory Magazine. The association now has 53 members.

THE Euclid Crane & Hoist Co., Euclid, Ohio, has joined the Material Handling Institute. H. H. Kumler, general sales manager, is the official company executive to be represented in the Institute.

The FLOW DIRECTORY OF MATERIAL HANDLING, a 400-page volume, is a valuable reference guide. It may be ordered from FLOW Magazine at \$6.00 per copy.



# "What does this TRADE-MARK mean to You?"

There is nearly half a century of conveyer engineering and manufacturing experience—and the facilities of three modern plants—behind this trademark. To plant engineers in many industries, it indicates a conveyer service that is complete from proposal engineering through erection in the field.

On the Boards in Mathews Engineering Departments today, systems of gravity and power conveyers and special conveying machinery are being developed to serve production and keep manual handling at a minimum.

Whatever your product might be, if it must be handled efficiently and economically, that is a job for Mathews Engineers. Keep in mind this complete, experienced organization, and the service it makes available to you.

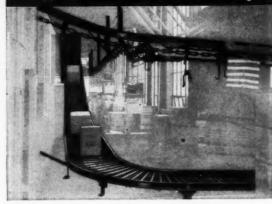


### MATHEWS CONVEYER COMPANY

MATHEWS CONVEYER COMPANY WEST COAST
SAN CARLOS, CALIFORNIA
MATHEWS CONVEYER COMPANY, LTD.
PORT HOPE, ONTARIO

Engineering Offices or Sales Agencies in Principal American and Canadian Cities

### Guilty of Manhandling



Be both judge and jury. Why not let Buschman Engineered Conveyors sentence your slow moving material to a life of speeded production? A complete line of conveyors for practically ever kind of industry (some of these are listed below.) Our engineers will gladly consult with you on your handling problems. Write for additional information.



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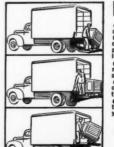
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### CONTAINER EFFICIENCY . . .

(Continued from page 59)

ago, is 10 feet long when assembled.

All interior packing is die-cut to support as well as tie down the heavy unit and its component parts. The packing is shown in Figure 4. This one container is engineered to package 16 different stokers, requiring only relatively simple modification of the interior packing.

The Iron Fireman shipping container is relatively complex from the point of view of the interior packing. However, occasionally it is found that material handling engineers are surprised at what can be accomplished with relatively simple inner packing. An example is Figure 4.

This illustrates a shipping container designed for a pressure cooker having short side handles. The drawing shows the scored sheets which are inserted in two opposite corners to protect the bakelite handles of the unit. The scored sheet consists of small panels, which create a spring effect. The handles are thus wedged and the product is held in a rigid position, preventing damage through shifting. The scored sheet at the sidewall "c" is added merely for illustrative purpose. It could, for example, be used for small parts

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### IRONBOUND

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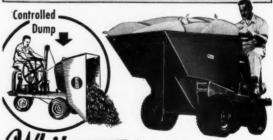
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will easily carry anything you can load in or on it. Does the work of 6 men. Controlled dump makes it easy to pour wet concrete, or part of a load. Turns on a dime. For maintenance or moving bulk materials, it quickly pays for itself.

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Heavy Steel Bucket

Fits through doorways

WRITE FOR PRICES AND ILLUSTRATED LITERATURE

MANUFACTURING COMPANY 3249 Casitas Avenue Los Angeles 26, California or accessories, which would thus be held securely and prevented from marring the product.

### Flexibility Promotes Economy

Another example of inexpensive and effective packing, with the added advantage of flexibility, is shown in Figure 5. This die-cut pad is approximately 8-5/8" x 8-5/8" and is used for packing two different items of similar contour.

One item is an insulated ice bucket. For packing, the bagged cover is inverted into the body of the bucket. The lucite knob on the cover is first inserted into the "sunburst" shown in the center of the pad. Thus the knob is protected from damage in transit. This method reduces the carton height approximately two inches, which is an economy feature.

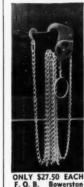
The two cut-outs at the sides of the pad (b) protect the fragile lucite handle, and also serve to hold the unit firmly in position within the package.

Feature (c) in this same figure, represents the modification required for the second item. Its cover is likewise inverted for packing, with the knob extending through the sunburst, and the handle through the cut-outs. However, this item has a pouring spout, which passes through the die-cut tab (c). Thus a simple modification makes the pad applicable to two different items.

The foregoing examples are but a few chosen from among many. They demonstrate the almost unlimited flexibility that can be obtained with relatively simple packaging materials. Note for example, the easy solution devised for the rather complex shape of the cocktail shaker with the knob handles (Figure 1). No miscellaneous pieces of inner packing were necessary—the only packing is the carton itself. The other examples likewise illustrate points of particular interest to the packaging and material handling engineer. Product protection is afforded; simplicity of design facilitates quick assembly and faster packing.

### WORLD'S EASIEST WAY TO OPEN ANY BOX CAR DOOR

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One man can open the most binding, balky box car door with the Nolan Car Door Opener. Get greater safety . . . speed loading and unloading schedules . . . order an ample supply to fill your needs today!

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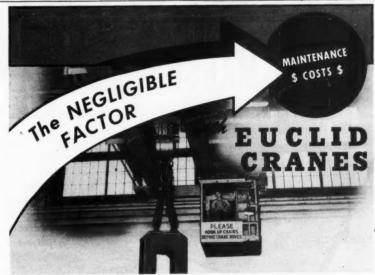
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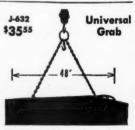
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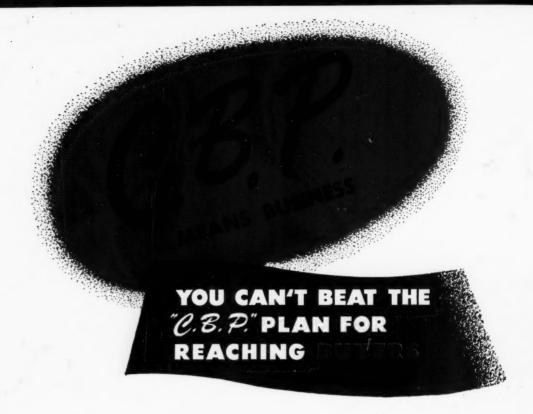
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